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FROM SCOTT TO FUCHS

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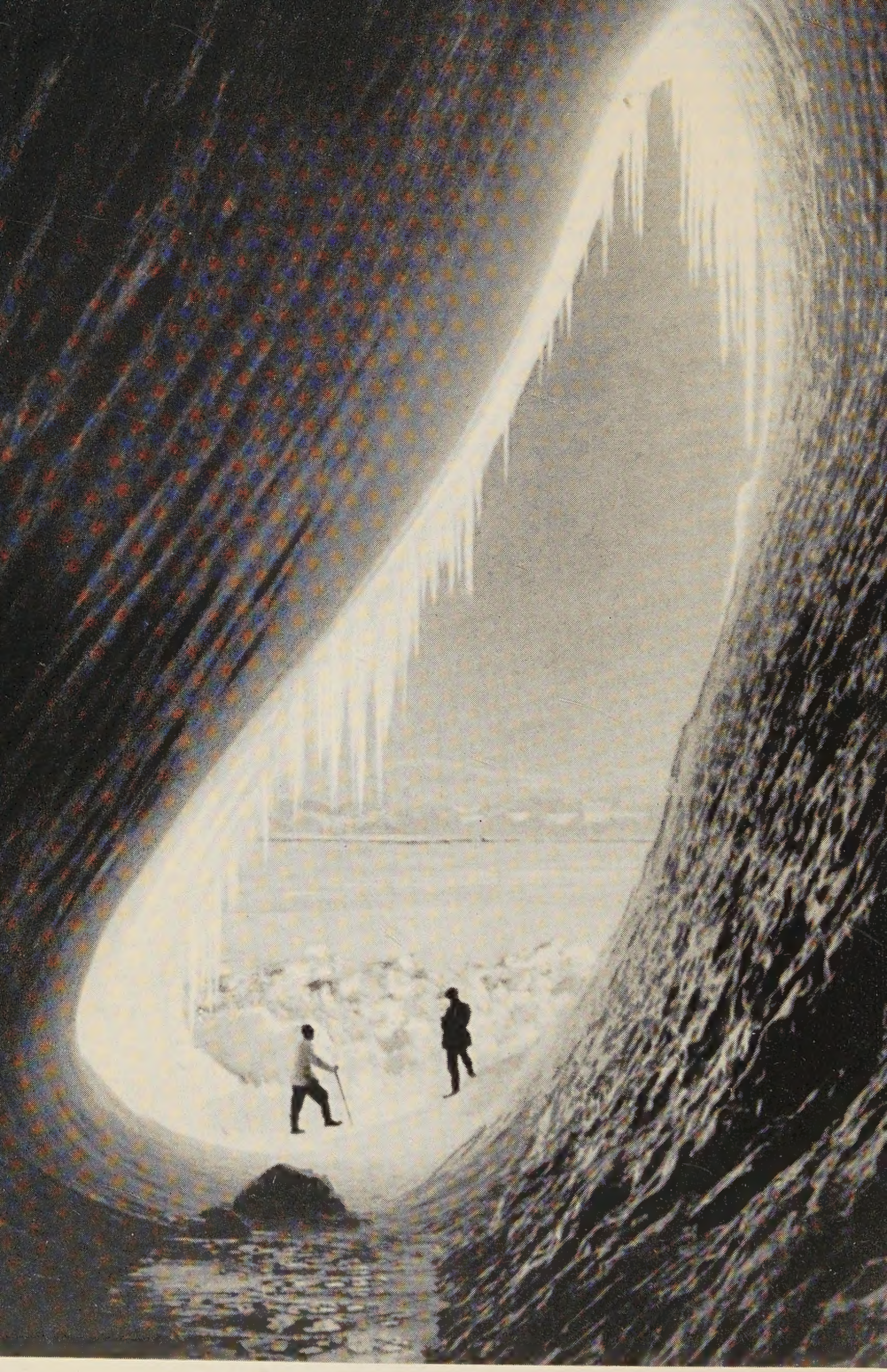

Members of Scott's Expedition at the entrance of an ice-cave.

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FROM SCOTT TO FUCHS

by

Gerald Bowman

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G. B.

FOREWORD

Since the fifteenth century, roving seamen believed that there was a sixth continent lying in the far south of the globe. Three hundred years were to pass before the first men set foot upon it. These were a Norwegian whaling captain, Leonard Kristensen, and his young companion, Carstens Borchgrevink, who landed on Cape Adaire on January 23rd, 1895.

They stood upon the edge of a land-mass now known to be about six million square miles in area (much larger than Australia), with the South Pole, roughly speaking, in the centre.

On this vast continent there lives no single human being—other than those who periodically come to explore. There is no land animal larger than an insect. There are no trees, and flowering plants. The highest summer temperature seldom rises above freezing point.

It is a continent still in the grip of an ice-age more frigid than any which, in the existence of mankind, has gripped any other part of the earth. It is the most isolated of all the continents, lying separated from the nearest mainland by 600 miles of the deepest and most tempestuous of oceans. The ice at the Pole has been proved by sounding to be 8,300 feet deep on a rock base.

On average, the surface of the great South Polar ice-sheet lies at a height of 6,000 feet, or twice as high as Asia. The area is considerably colder than the North Pole, and is swept by permanent icy west winds which average over 50 miles an hour and often reach 100 m.p.h. and more. Yet during 400 years men have endured and died in their search for this continent and, having found it, in exploring and surveying its frozen, lifeless wilderness. Why?

Apart from the whales and seals of the Antarctic waters, there was nothing known in early times to be worth having. Even today, when coal, precious metal and even uranium deposits are known to lie there, it would be scarcely possible to mine them.

Why therefore have Dr. Fuchs and Sir Edmund Hillary crossed the frozen continent at the head of costly expeditions? Why have America, Russia and most of the other nations established posts and stations all over the icy wilderness and even at the Pole itself? What is the practical use of it all?

The most important part of the answer, which I shall attempt to give in this book, lies in the men themselves—in their dreams, their courage and the quality of their characters. Only by knowing these things can the pattern of an heroic but seemingly useless odyssey be grasped and understood.

The earliest of the searchers for the Southern Continent followed the stout-hearted Dutch navigators, Schouten and LeMaire, who sailed round Tierra del Fuego in 1615, and were followed by Sir Francis Drake some sixty years later. This is the area of Cape Horn which gave rise to the legend of the *Flying Dutchman*—the ship so beset by contrary winds that every man of the crew died—with the wraith of the vessel still said to sail on.

In unromantic fact, however, the Cape Horn winds, rather than the men who fought them, started the first Antarctic exploration. Ship-masters were constantly driven far south when trying to round the Horn, and found themselves in massive ice-packs which they mistook for land—for the legendary sixth continent.

Land, in the shape of "the Isle of Desolation" (now known as Kerguenland) and Bouvet Island, was discovered in 1771, and in the following year the great Captain James Cook of the British Navy sailed further south than any man before him, entering the Antarctic Circle for the first time. He discovered South Georgia and the South Sandwich Islands, and crossed from the extremity of South America to that of South Africa.

This magnificent voyage, strangely enough, might well have stopped Antarctic exploration altogether, for Cook found no land of any kind between Cape Horn and the Cape of Good Hope. As a result he came to the conclusion that no sixth continent of the South existed, and the scientists and explorers of his time took the same view.

The legends and seamen's tales which had sent men southward were discredited. Indeed, it is possible that the South Pole might have remained undiscovered to this day but for that interesting and engaging creature, the seal. Captain Cook reported large numbers of seals in the South Georgia area. Sealing expeditions therefore went out from America and Britain with the added object of finding new areas for whaling.

The first man actually to see the Antarctic continent was a young fellow, already a navigator and shipmaster at the age of twenty-one—a Connecticut Yankee, Nathaniel Palmer, whose name is immortalised on charts of the Grahamland peninsula.

In 1820 Palmer commanded the 45-ton sloop *Hero*, which was acting as scout-ship to an American expedition seeking new sealing areas. The pelts of first-class buck seals at that time would fetch up to 2 dollars in New York—and much more if taken to the markets of Canton, China, although such a venture across the Pacific might mean a voyage of two years. In any case a single trip of a few months to the breeding grounds south of Cape Horn and back to Connecticut could mean a killing of 10,000 seals—and a cash return of 20,000 dollars, or about ten times the total cost of the project. It was a get-rich-quick business and literally millions of seals were exterminated, not only by American but also by British expeditions. It was a "trade" of which neither nation has since been proud, even allowing for the more insensitive standards of the time. Inevitably, of course, the breeding grounds were depleted. The seals moved. They had a vast, uncharted, ice-bound area in which to find peace and security for their own way of life.

Nat Palmer was one of the earliest to try to track them in the remote solitudes of the furthest south. In doing so, on November 18th, 1820, he crossed the Bransfield Strait, and beyond "a sea filled with Immense Ice Bergs" he saw a "shore everywhere perpendicular". He could not land, but on that morning he became the first man in recorded history to set eyes on a vast continent for which men had searched through two centuries.

As a matter of history, Palmer found immortality for more than that. He became rich in sealing, and then returned to Connecticut to start designing and building ships. With one of these, the *Siddons*, he took the Atlantic record in 1840, sailing from Liverpool to New York in fifteen days. Four years later he capped this with his clipper-ship *Honqua*, with which he beat all the China tea clippers of the time with an eighty-four-day run from New York to Hong Kong.

Palmer, therefore, was no ordinary, lucky-strike adventurer. He had more, much more, than brute courage, physical strength and hardy endurance. He had a good, flexible mind, he was inquisitive and he could concentrate. Risk was something he could figure coolly against achievement; and if the achievement was great enough he would pursue it well beyond the calculated risk.

In these qualities he was typical of all who have since explored the ice-bound continent of Antarctica.

In brief, the great south continent was first seen by an American and first landed upon by Norwegians. The first journey inland to the South Magnetic Pole was achieved by a Briton, while a Norwegian was first to reach the South Geographical Pole. Of these matters more will be said later.

Meanwhile, there are nearly a hundred names of ships' captains and explorers of all the civilised nations, each of which has an honoured place in the history of Antarctic exploration. Many of those names are immortalised on the Antarctic charts of today—as in the Weddell, the Bellingshausen and the Ross Seas, the Bransfield Strait, the Biscoe and Drygalski Islands, and Wilkes Land.

A full list of all the men with their achievements from the year 1739 to the present day is given in the Appendix to this book.

My main purpose here is to tell of the Antarctic explorers of our own century, from Captain Robert Falcon Scott, who first went south in 1901, to Dr. Vivian Fuchs and Sir Edmund Hillary.

Part One

SCOTT

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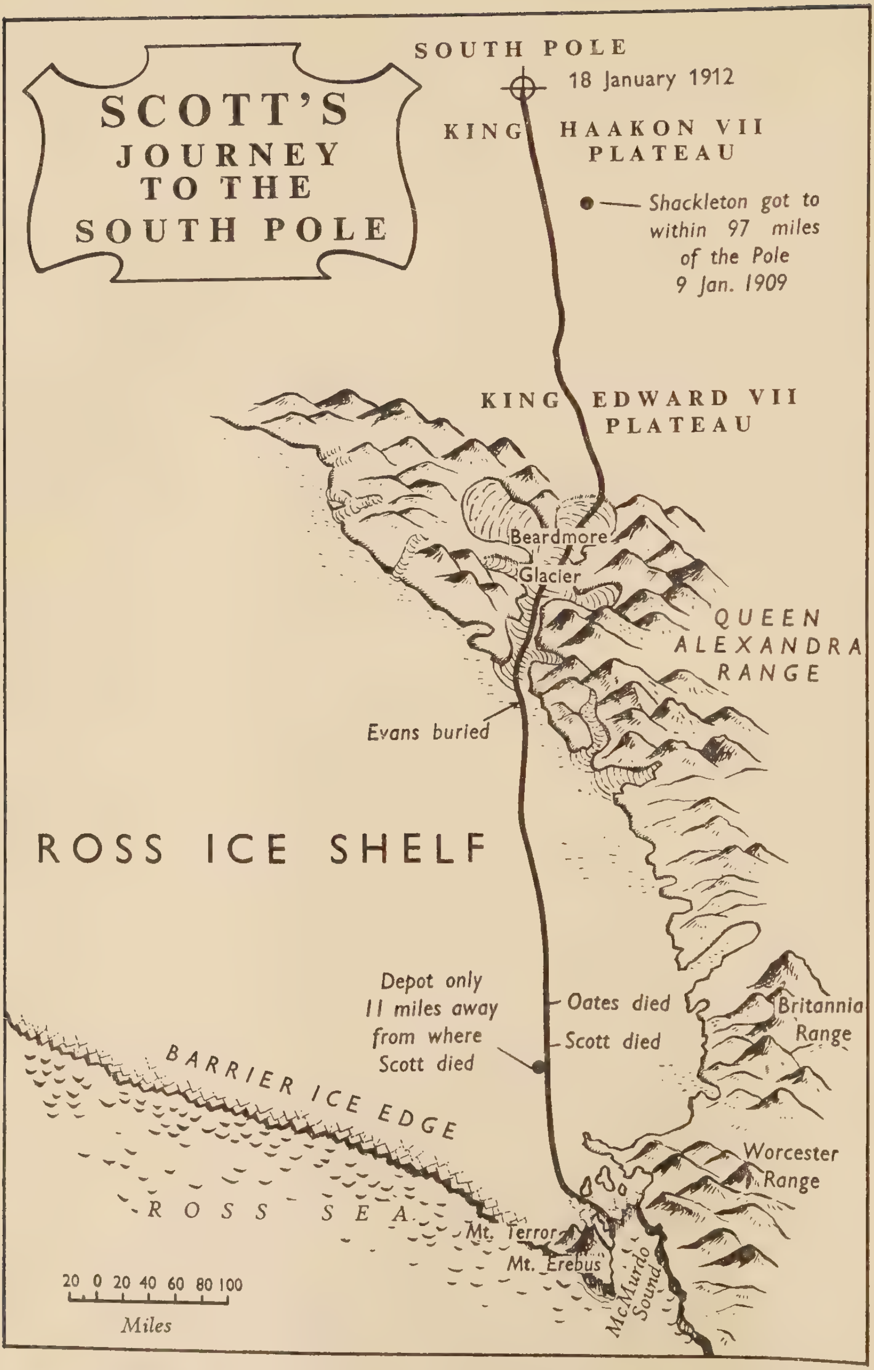
SCOTT'S JOURNEY TO THE SOUTH POLE
SOUTH POLE
18 January 1912
KING HAAKON VII PLATEAU
Shackleton got to within 97 miles of the Pole 9 Jan. 1909
KING EDWARD VII PLATEAU
Beardmore Glacier
QUEEN ALEXANDRA RANGE
Evans buried
ROSS ICE SHELF
Depot only 11 miles away from where Scott died
Oates died
Scott died
Britannia Range
BARRIER ICE EDGE
Worcester Range
ROSS SEA
Mt. Terror
Mt. Erebus
McMurdo Sound
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Miles

CHAPTER I

Most of those who become heroes in wartime are peaceable citizens at heart. By the time they win their decorations they are usually only sketchily trained warriors by professional standards. They are, indeed, citizens in uniform and, having reached their great moment, they return to peaceful citizenship—if they return at all.

The hero of tranquil times, such as Captain Scott, must have something rather different in his make-up. There is no national enemy to test his courage—for him the normal struggle for wealth, or success in a profession, which means fulfilment for most men, is not enough. The making of a home, the founding of a family, are little more than pleasant incidentals. Usually, such a man is ridden by an obsession, whether it be to prove an intuition in research to the very risk of his life, or to explore in solitudes where no men have gone before.

Men like "Ed" Hillary find their *métier* early. In his case an amateur climbing holiday in his teens set him on a course to which he devoted every spare moment of his life in training, in reading and in action, until he stood on the summit of Everest.

Such men carry the urgency of war within their own spirit, and —like Scott and his followers—face the same penalty; for even in war men can give no more than their lives. Such men are capable of more than the acceptance of challenge. They seek it out; they have the clear vision, however far it may lie ahead, and for them the vision is the greatest of all realities.

Scott, however, seemed not of this order. He had no early vision; he was obsessed by no fanaticism of purpose. The opportunity of achievement did not come to him until he was a grown man of thirty, and then it came by pure chance. Indeed, with his habitual honesty, he later admitted that until that chance occurred:

"I had no predilection for polar exploration . . . it shows how curiously the course of one's life may be turned."

In spite of this apparent contradiction of character he lived to become the most indomitable explorer of his time, and when he died, in bitter disappointment and failure, he was enshrined in the hearts of his countrymen as one of the greatest heroes in their long history of adventure.

Scott's power—the leadership and the iron fortitude he was destined to show on Polar marches—came from a secret side of his character which he confided to diaries, made public only after his death. This was an obsession indeed, although for more than half his life it drove him in no set direction.

The obsession was in regard to himself. He was haunted by what he felt to be the purposelessness of life. He longed for an aim worthy of the dedication of his soul, but for years could not find it. With this longing he was beset, even after he had started his quest, by fear that he might fail.

A diary entry written when he was twenty-two is illuminating:

"It is only given to us cold, slowly-wrought natures to feel this dreary, deadly tightening at the heart, this slow sickness which holds one for weeks. How can I bear it? I write of the future, of the hopes of being more worthy, but shall I ever be . . .? No one will ever see these words, therefore I may freely write 'What does it all mean?' "

Such introspection, such rather over-dramatized reveries, are not out-of-the-ordinary among imaginative youths. Scott was unique only in carrying the attitude of mind to a time of life at which lesser men have forgotten early frustrations and accepted narrow, if more practical, ambitions.

In this respect he remained a moody, romantic adolescent through maturity and indeed to the end of his days.

Yet it was this—call it limitation if you will—which gave him almost fanatical purpose in following his star, once he had found it; it was this which made him one with all other men of high achievement.

Scott was highly intelligent; perceptive, logical and shrewd in all his reasonings, with one exception—his emotional view of himself. The standard of life he set for himself was that of a very Bayard of integrity, honesty and courage. That standard he fulfilled if ever a man did, to the moment of his death. Yet he lacked the spark of humour which helps all normal men to accept the fact that they are human and therefore imperfect without worrying about it overmuch. Scott, in the secret tribunal of his mind, allowed himself no mercy, and it was this which so often made him solitary and withdrawn even from his closest comrades, and very often obscured what they had good cause to know as the genuine kindness and generosity of his nature.

In the books he published and the logs he kept of the two expeditions deep into Antarctica, Scott showed himself to be a descriptive writer of considerable talent. These are more than the plain, factual accounts to be expected of a man of action. They show the quality of a restless and critical mind. He was far too courageous—too proud—to show the introspective uncertainty and fear by which he was haunted; but the honest picture he gave made him the more controversial in the years that followed.

On his first expedition Scott and his comrades reached furthest south of any men in history. It was a venture of outstanding success which men competent to judge knew to be due to brilliant leadership. When Scott returned to civilisation he found his name famous across the whole world. He had shown the way to the South Pole, and proved the possibility of getting there. It was natural, therefore, for him to be chosen as leader of the second expedition of 1910, the attempt upon the Pole itself. All his original team of adventurers were full of his praises and keen to follow him again—all save one. That one was Ernest Shackleton.

From early in the first expedition a total difference of temperament between Scott and Shackleton had been apparent to all the other members. In the curious, rather tragic way that such things can happen, there was a mutual admiration between the two; each knew the other to be beyond question courageous, dedicated to the work in hand, iron in fortitude. But, to put the matter in simple terms, they got on each other's nerves.

It may well be that the driving strength which was the basis of each man's character brought friction between them. Although neither introspective nor emotional, Shackleton, too, had his vision, and was a leader of equal genius, as he was destined to show in the expeditions he led in the years to come. Meanwhile, he was the only one of the original party to whom Scott ever showed the volcanic, flaring temper of which he was capable, but which he otherwise kept under rigid control. This reached such a point that during one long march across the ice, Dr. Wilson, always Scott's closest confidant, took him aside and spoke bluntly and fearlessly.

Scott's reaction showed the greatness of which he was capable. All three men were in a state of exhaustion, half-starved and strained by the fact that they were forced to drive a dog-team weakened by bad food. As Wilson finished speaking he more than expected to get the bitter edge of the leader's tongue; but Scott merely drew a sharp breath and quietly answered, "Thank you, Bill."

As from that moment he controlled himself. His attitude to Shackleton changed, and he showed all the friendliness and tolerance which a leader should to a comrade he knows to be first-class.

Shackleton was not a member of the second expedition, which is understandable from either man's point of view. Both were destined to end their lives in the south lands after great personal achievements. Shackleton undoubtedly hastened his own death by the unremitting strain to which he put himself, but he was spared the circumstances akin to classical Greek tragedy in which Scott, Dr. Wilson and their three comrades had to accept death in full knowledge of its inevitable coming after they had endured the stark disappointment of being beaten in the attempt which cost them their lives.

For when they actually reached the South Pole they found the tent of the Norwegian, Roald Amundsen, already there.

CHAPTER II

The events of Scott's first "Furthest South" expedition will not be detailed here. Although it lacked the glamour of an actual journey to the Pole, it was not only Scott's greatest achievement, but one of the greatest feats of exploration in history. As an unqualified success it aroused no controversy concerning his powers of organisation and detailed planning, such as arose after he and his party died on their march back from the Pole in the second expedition.

The manner of Scott's becoming an explorer at all was, as has been said, by chance, and throws a light upon his strange character.

Robert Falcon Scott came of a comfortable, upper-middle-class family which had provided the Royal Navy with officers through a number of generations. His own father, however, was a brewery-owner in Plymouth. In early life young "Con" Scott, as he was known to his brother and sisters, experienced nothing but comfort and sufficiency. Their house, "Outlands", was large and rambling and formed a happy enough playground for a parcel of children who were largely allowed to run wild. Con knew his father as kindly but irascible. Years were to pass before he was to discover that his father's volcanic outbursts of temper were the result of secret worry over bad business, and a succession of law-suits.

His capacity for enduring solitary anxiety was undoubtedly inherited from his father. From his mother he also drew much of his strength. Of the highest and most unbending moral standards, Mrs. Scott was uncompromising to any faults of weakness or backsliding. She gave a great part of her life to the well-being of others in addition to her own children, but her austerity in this way found an understanding echo in her elder son. Con, in fact, idolised her, and to the end of his life wrote to her in confidence, telling much of his inner troubles and worries.

This is of interest in itself because, by his own admission and that of his sisters, he was indolent as a boy, hopelessly untidy and backward to the point of laziness in his school work. He seemed to be frail in physique, and there were signs, worrying to parents, that the dreamy, moody, quick-tempered lad had all the makings of a hypochondriac.

Always he was outshone by his younger brother, Archie, a cheerful lad, clever in almost anything he attempted, and loved by everyone—including the moody Con who, unexpectedly, showed not the slightest jealousy of him. It was all part of his tortuous nature that, while he brooded and longed for the great fulfilment of his life, he accepted Archie as the success of the family and, after he had passed through Woolwich to a commission in the Royal Artillery, wrote a glowing letter of congratulation foretelling a great future for him.

Scott entered the Navy through a cadetship in *Britannia*, became a sub-lieutenant in *Amphion* and decided to specialise in torpedo work. From the first he loved the Navy, but again the contradictions of his character made him difficult for his comrades to "know". Still chaotically untidy in his own quarters, he became exact and precise about all work in hand and a very dragon for detail in his dealing with subordinates. At this time of his life he showed that he could work with fanatical concentration at anything which genuinely caught his interest. Outwardly, he seemed not unlike any other young naval officer, if a little reserved in his general manner. His laugh was rare, but extremely charming when it came. He was not what is called a good mixer. He was far too intelligent and imaginative to play up to the part of the bluff sailorman. He adopted no pose, and disliked being in a crowd.

Years later, in one of his rare flashes of humour, he admitted that from the age of nineteen he had dreamed himself in love with half a dozen different girls. But it was a love of idealisation, and rendered him more than ever silent in their company. As a result, he learnt nothing of women although he admitted to liking their company.

By his capacity for work and natural ability he laid the foundation of a sound career in the Navy. Only his frequent entries in his diary were evidence of the blind longing for achievement which still dominated his secret mind. When he was twenty-six and a full lieutenant serving in the Mediterranean in a torpedo school-ship, news came which sent him hurrying home to face the first real problem of his life. It was a serious problem, indeed. His father's business was collapsing and, unless something could be done, the family faced ruin.

Scott did that something quickly, efficiently and with shrewdness. In those months he showed that he had an unexpectedly sound business head. He sorted the difficulties, let the house, transferred the whole family to another home and helped his father buy another brewery, unencumbered by difficulties.

At this period Scott felt that his naval career was ruined because he had had to get himself transferred to a ship in the Home Command. Moreover, he and Archie, who was then serving in Lagos, took it upon themselves to bear the family expenses. Both the brothers had to economise in their way of life, and economise hard. Their sisters, with equal courage, set about finding their own livings. By joint efforts, inspired and led by Con, they had finally put their financial situation straight, when old Mr. Scott died.

Such a little history of fighting through bad times and winning back to respectable solvency is only one of thousands among self-respecting English folk of any class or background. Such cases have happened and will happen in all generations.

Scott, however, was still convinced that he had ruined his naval career when, seven years later, he had to endure the blow of Archie's sudden death. Although he wrote his mother a quite wonderful letter of comfort and encouragement, he himself was plunged into one of the worst of his recurrent moods of introspective despair. Yet now, when he felt most hopeless, fate brought the great chance of his life.

On a sunny afternoon of the July of that year, he was moodily walking along Buckingham Palace Road in London when he met a family friend, the famous geographer, Sir Clements Markham. As the two walked along together, chatting, Markham mentioned a subject in which Scott had never felt any interest and to which he had certainly given no thought. Had he heard about the Antarctic expedition which was being mooted? He certainly had not, but as he walked with his friend along the busy pavement, a sudden idea flashed into his mind. He had the bold conception of applying for the expedition leadership. Two days later, after seeing his friend again, he did so, although he felt he was only one of scores of other lieutenants in the Navy with nothing to distinguish him in special achievements or even in examination results.

The fact that Markham's friendship helped him is not to be denied. Sir Clements had known him since he was eighteen and afterwards wrote ". . . I was much struck by his intelligence, information and the charm of his manner. My experience taught me that it would be years before any expedition would be ready and I believed that Scott was the destined man to command it."

In the outcome Scott's standing and record in the Navy proved to be far higher than he had dreamed. He was at the right age. As far as men could be judged for the sort of task, the details of which were then very little known, he ranked as the right type. In any case, his application was accepted, and before long he received notification that the task was his. After which, to quote Sir Clements again, "he entered upon the enterprise with enthusiasm tempered by prudence and sound sense. . . . It was mainly through his own unique, unconquerable personality that the expedition became a living fact".

Markham, President of the Royal Geographical Society, backed his judgment to the full. He was the moving spirit behind the Society's badgering of the Government of the time to finance an Antarctic expedition—the first British expedition of the kind for sixty years. As a result the Government agreed, and Scott went off to Scotland to superintend the building of what was destined to become one of the most famous ships in history—the stout little *Discovery*, specially designed for work amongst the ice-floes.

With his zest for meticulous detail he overlooked the building from the laying of the keel to the installation of the engines—to the stepping of the masts and the bending-on of the newly-cut sails. In addition to this he organised every detail of supplies needed to carry an expedition for three years.

In this, the long business head he had shown so unexpectedly at the time of his family's trouble was more than ever apparent. He found himself bedevilled by the work of well-meaning committees which retarded rather than speeded up preparations. After a flying visit to Berlin, where a German expedition was being organised, he came back a very bundle of volcanic indignation and energy. The German equipment, he proved, was far superior to the material supplied by his committees. He demanded that the whole organisation, from that moment, should be put into his own hands with no one to say him nay. Wisely, the authorities gave him *carte blanche*, as a result of which preparations expected to take a couple of years were completed in the next eight months.

In one other matter also he had been given a free hand from the start. He demanded that he should be allowed to recruit the members of his team only from the Navy. In this he stressed the high quality of Naval discipline and added, with the almost naïve frankness, which was so typical of him, that he had grave doubts as to his own ability to be able to deal with any other class of men.

The two most prominent members of his first expedition were Dr. E. A. Wilson, soon to become his closest and most trusted friend, and Lieutenant (later Sir Ernest) Shackleton, whom he chose from the Royal Naval Reserve. Finally, with a total party of fifty, he set sail from England on August 6th, 1901.

In assessing the truth beneath all the arguments following his disastrous second expedition, it is a matter of normal common sense to note what an enormous factor sheer luck can be in any venture of the kind. Generally speaking, the luck on his first expedition was as benign as it was malignant on the second. Any leader in such circumstances has to take calculated risks. In doing so his calculations can seldom allow for more than an average amount of ill fortune. Throughout his first three years in Antarctica, Scott found his allowance for ill luck more than generously covered in his planning.

Since those years formed his total experience of Polar work when he started the second expedition, it is difficult to agree with those who hold that he grossly miscalculated the hazards that led to the final disaster.

Meanwhile, so brightly were Scott's stars shining that within four days after the *Discovery* first met the Antarctic pack-ice she had been conned through and was steaming in the open water of the Ross Sea.

Scott's first exploration was to cruise along the Ross Barrier. This is where the gigantic mass of ice which fills the Ross Bay has its seaward edge. From sea level the white cliffs tower from 80 to 200 feet high. At the inner extremity of the bay, roughly about 400 to 500 miles from the Barrier edge, the land rises up, dotted with mountain peaks and furrowed by glaciers, but at that point is nearest to the South Pole. Scott charted the Barrier wall for over 1,200 miles—twice as far as it had been explored before. In the course of the voyage he discovered Edward VII Land, the furthest limit of the gigantic, ice-covered bay. On the way back he landed on the Barrier ice and made the first aerial trip in history over the Antarctic continent.

Although this flight was made in a captive balloon, it is so illustrative of Scott's courage that the story is worth a little space. Before leaving England the expedition had been provided with two balloons, each capable of taking only one man at a time. Their possible use for observation purposes was undeniable, but Scott had never been much interested in the idea of flight—at that period no aeroplane had yet left the earth. He deputed a few members of his party to undergo training in balloon-inflation and control. The specialists learned their job well, but, when the first balloon was filled and tugging at its captive cable on the Barrier ice, Scott decided to be the first man to go aloft.

In this he had no instinct of gaining extra glory over his comrades. Indeed, on his own admission, he was frightened by the task he had set himself. But throughout the long cruise of exploration he had been frustrated by getting only occasional glimpses of what lay beyond the towering cliffs of the Barrier ice. Whenever the Barrier was low enough he had spent hours at the mast-head, but even then the view was meagre and often obscured by snow or fog. Now at last in clear weather there was the opportunity of a perfect view from a really good height, and this he could not deny himself.

Anyone who has had anything to do with balloons will know exactly what he felt like as the ground party began paying-out the captive cable.

"I was contemplating the first ascent I had made in any region," Scott afterwards wrote, "and as I swayed about in what appeared a very inadequate basket and gazed down on the rapidly diminishing figures below I felt some doubt as to whether I had been wise in my choice."

The balloon rose to 500 feet and there remained static owing to the weight of the wire rope. For a man who had never left the earth before in his life this might well have been more than sufficient. There is a feeling of utter helplessness—of dangerous dependence on others—in bobbing about at a vertiginous height at the end of a rope which looks thread-thin. The besetting instinct is to come down as rapidly as possible. Scott's reaction was typical. Although at the mercy of all the nightmare feelings common to balloon first-trippers, he decided to go up further. He had a job in hand, and wanted to see as far as was possible. Therefore he shouted down for more height.

In the answering shout from below he recognised the word "sand" and realised that the matter was in his own hands. Further height could be achieved by the judicious throwing out of ballast. But where a normal man might have emptied a bag or so over the basket side and checked results, Scott would not permit himself any such timidity. He seized all the sandbags he could see and tossed them out: "With the result that the 'Eva' (as the balloon had been christened) shot up hurriedly and as the rope tightened commenced to oscillate in a manner that was not at all pleasing. Then as the rope was slackened I again ascended but, alas, only to be again checked by the weight of the rope at something under eight hundred feet. Our wire rope was evidently too heavy to allow greater altitude . . . but as it was my view was very extended, and probably afforded as much information as would have been obtained in a loftier position."

Scott made his observations coolly and collectedly and recorded them in his log. Only when this was finished did he signal to be hauled down, and then Shackleton went up with a camera to collect photographs.

Both verified the existence of vast glaciers extending in the direction of the Pole, which they judged to lie on or beyond a plateau only faintly seen in the distance. The *Discovery* then headed back to McMurdo Sound, and found a sheltered harbour on the south side of Ross Island, where huts were erected on shore. Soon the ship was solidly frozen-in, and from this point, 400 miles further south than any men had ever before wintered in the Antarctic, sledging journeys were made which culminated in that achieved by Scott, Shackleton and Wilson, who reached 82 degrees 17 minutes south, or only just over 500 miles from the Pole, on September 30th of that year.

It was this journey which firmly established Scott in the front rank of the greatest explorers in history, although only a few years had passed since the idea of Polar exploration had first entered his head.

His energy and physical endurance on this—as on all other journeys he undertook—were phenomenal. It was said of him that whenever he set out on a march he went with almost fanatical urgency. He grudged the planned times for rest and was always first to be on his feet fidgeting—pleading—for a re-start. It was in action that his solitary remoteness seemed to leave him, and he became a vivid companion glowing with encouragement.

On the return journey of this epic march Shackleton, who had been stricken with scurvy, had to become almost a passenger. At this point all the nineteen dogs used for pulling the sledges had either died in their tracks or had had to be killed. Eventually Shackleton became so ill that for long periods he was unable to walk. Scott and Wilson then hauled him, lying helpless on the sledge, and by their joint effort got him back alive to Hut Point. By that time the relief ship *Morning* had arrived and was lying some miles away at the edge of the ice-pack. Shackleton was taken aboard for treatment, and had to resign himself to being invalided home when the ship left again early in March.

The party spent a second winter in the ice, and in the spring Scott took two seamen, Evans and Lashly, both men of iron strength, on a sledge trip without dogs up the Ferrar glacier and on to the Polar plateau. It was a memorable 600-mile journey made even more unique by the fact that Scott's navigation tables were lost in a blizzard, and for a great part of the return journey he had to work from memory. Nevertheless he got his little party home safely.

A few days later the relief ships, *Morning* and *Terra Nova*, arrived and brought orders that made Scott furious. He was commanded to bring his expedition home. Two winters at a point so far south were considered more than enough for men who had done so well. Their leader was also instructed that, if the *Discovery* could not be freed from her frozen-in position during the next six weeks, she was to be abandoned and the whole expedition was to return on the relief ships.

Scott was then undoubtedly at the peak of success. The luck had been with him, and he and his comrades had achieved magnificently in all their ventures. Indeed, he had already decided to spend yet another winter in the white solitudes if the ice did not break.

Yet orders were orders. Scott was above all a disciplinarian in the highest Naval tradition. For over five weeks he tried every method he could think of to break the ice and get the *Discovery* free, since the idea of abandoning his ship was unbearable.

The fifth week passed and still the ship was fast. Only then did Scott accept the seemingly inevitable, and order preparations for her to be abandoned. Three days later good luck favoured him again.

A sudden call from below sent him racing to the bridge and there:

". . . I have never witnessed a more impressive sight . . . the wind had fallen to a calm and not a sound disturbed the stillness about us. Yet in the midst of this peaceful silence was an awful unseen agency rending that great ice sheet . . . for weeks we had been struggling with this mighty obstacle . . . but now without a word, without an effort on our part it was all melting away and we knew that in an hour or two not a vestige of it would be left, and that the open sea would be lapping on the black rocks of Hut Point. Fast as the ice was breaking it was not fast enough for our gallant relief ships; already we could see them battling through the floes with a full head of steam."

So ended Scott's first expedition. It took twelve hours more of difficult and hazardous work to get the little ship completely free from the ice. After which he made another entry:

"In half an hour we were passing close by Hut Point and the small bay in which we had spent such long months . . . as we sped along we looked for the last time with almost affection and regard on the scene which had grown so familiar, on the hills of which we knew every ridge and fold, on the paths which our footsteps had so often trodden, and on the huts and other signs of human life which we were leaving behind us. One wonders what is happening now in that lonely solitude, once the scene of so much activity."

In that solitude, within the next five years, he and four companions, Wilson, Evans, Oates and Bowers, were destined to fall into their eternal sleep. But in the manner and in the cause of that tragedy the luck which had hitherto always turned in Scott's favour implacably turned against him with a regularity for which no calculated planning could have allowed.

CHAPTER III

SCOTT returned to London to be granted nine months' leave in which to write *The Voyage of the Discovery*, which had enormous success. He received promotion and honours, became Naval Assistant to the Second Sea Lord at the Admiralty, and managed to steer a typically straight course through the whirlpool of invitations which always surround the newly-famous. In the autumn of 1908 he married Kathleen Bruce, a sculptress, and under her influence his strange, introspective nature lost much of its tension. Yet all the time he was busy organising his second expedition. This he did almost entirely on his own responsibility, although he received help from the British and Dominion Governments. He managed to get the *Terra Nova*, a larger vessel than the *Discovery*, and recruited his followers for the most part from those who had been on the first expedition.

In the interim Shackleton had organised and led his own expedition to the South, discovering the Magnetic Pole and putting himself in the same rank of explorers as his late leader. Of Shackleton more will be said later. All that concerns us at this point is that Scott had asked him not to use their old base headquarters at Hut Point, since he, himself, intended to operate from there again, and this agreement Shackleton loyally carried out.

It was to Hut Point in McMurdo Sound that Scott therefore returned, having left England in June 1910. Not long before, he had become the father of a son destined to win honour by high personal courage, and fame by the artistic skill inherited from his mother.*

Scott's driving ambition, ever since returning from his magnificent "Furthest South" march, had been to reach the South Geographical Pole, and this was the object of the expedition he now led. From the first, however, he had been conscious of the importance of scientific investigation as the most practical reason for an Antarctic venture. He had strong scientific interests and a good deal more than an educated layman's knowledge of geology and meteorology.

He therefore strengthened the technical party which was under the direction of his one really close friend, Dr. E. A. Wilson, with three geologists: Frank Debenham, T. Griffith Taylor and Raymond Priestley (the last-named had already been South with Shackleton). Apsley Cherry-Garrard, later famous for his brilliant book, *The Worst Journey in the World*, was appointed zoologist; E. W. Nelson was biologist; G. C. Simpson was meteorologist and C. S. Wright physicist. Wilson, moreover, had the assistance of two other doctors recruited from the Navy: E. L. Atkinson and G. Murray Levick.

Meanwhile, among those who figured most prominently were Lieutenant E. R. G. R. Evans (the late Admiral Lord Mountevans), who had been to Antarctica in the *Morning* during Scott's previous expedition, and who was now appointed second-in-command; Lieutenant H. R. Bowers of the Royal Indian Marines, Captain L. E. G. Oates of the Sixth Inniskilling Dragoons (who was specialist-in-charge of nineteen Manchurian ponies) and three stout ratings who had worked and endured so magnificently in the first venture—Leading Stoker Lashly and Petty Officers Edgar Evans and Thomas Crean.

Scott's second journey through the pack-ice and into McMurdo Sound was vastly different from his first. The *Terra Nova* was beset by storms and heavy seas, and it was not until January 1911 that the expedition was landed and built a hut on a promontory afterwards to be named Cape Evans. Directly it was possible to get a strong sledge party organised, Scott set forth to lay the first, and one of the most important, depots for his forthcoming attempt upon the Pole. In this he led a party transporting about a ton of

* Commander Peter Scott, D.S.C., R.N.

stores and fodder for the ponies with the object of placing it at latitude 80 degrees south on the Polar route.

The venture met with unexpected difficulties which became insurmountable when the exhausted ponies reached the end of their tether and could be driven no further. In the result the "One-Ton Depot" had to be placed 36 miles short of the intended position. Critics of Scott have been concerned with the fact, and have pointed out that that 36 miles meant the difference between life and death on the tragic return march. All details of the venture, however, must be considered before anyone of fair mind can pass judgment.

If it could be proved that Scott was in a hurry, it would have been no more than natural in the circumstances, for he already knew that another man was contending for the honour of being first at the South Pole. At Melbourne, on his journey out from England, he had received a telegram dated from Madeira—*Am going South. Amundsen.*

Scott knew the skill and energy of the tough Norwegian, Roald Amundsen, whose experience of the Antarctic was more extensive than his own. Amundsen's wonderful achievement will be dealt with in its turn; in the meantime Scott had no knowledge of where he and his party might be. That knowledge came suddenly and as a considerable shock.

While the One-Ton Depot was being laid, the *Terra Nova* sailed along the Ross Ice Barrier with orders to establish a second base on the new land Scott had discovered and named after King Edward VII. Scott's idea had been to establish an independent party at this point, but when the vessel returned it brought the news that Amundsen had already arrived and established a base at the Bay of Whales.

This point lay a full 50 miles closer to the South Pole than Scott's own headquarters at Cape Evans. Up to this point he had not planned his journey to the Pole in any sense as a race against time. In collaboration with Dr. Wilson he had laid out a carefully considered programme of scientific investigation. Without the results to be obtained from this, he felt that the risking of men's lives in the attempt upon the Pole would be not much more than a demonstration of marching skill and endurance. He confided this feeling to Dr. Wilson—any attempt to race would have ruined their plans, and was not what they had in mind.

It was more than likely that Amundsen could reach the Pole first because he would travel fast with dogs and would allow himself to be delayed by no other object.

In his journal Scott wrote: "The proper as well as the wiser course for us is to proceed as though this had not happened. To go forward and do our best for the honour of our country without fear or panic."

This, in all fairness, disposes of criticisms about hurry in the laying of the One-Ton Depot short of the projected point. It proves that Scott refused to risk his own life or those of his men by any sudden alteration of carefully-laid plans.

It can fairly be asked why he did not race to the Pole, since he knew that Amundsen was in the field. Why undertake the Polar journey at all and risk lives when he had a fair idea that he would be beaten?

The questions are reasonable, but they can be answered only in terms of his own temperament. Moreover, the journey to lay the One-Ton Depot had been one of the worst in his experience; the men had been tried to the limit of endurance and needed time to recuperate. Apart from the failure of the exhausted ponies, fate had dealt the One-Ton party a heavy blow by sending a blizzard which at one point held them up for a full three days.

Blizzards of a few hours' duration were to be expected on that part of the Barrier during the summer, but such a storm was beyond all normal calculations.

Later, when he was travelling with the section using dogs to haul the sledges, Scott's team suddenly fell through the ice into a crevasse. Two dogs could not be saved by hauling up—they had dropped out of their harness and landed on the ice some 60 feet down. Scott insisted on his comrades lowering him into the crevasse, where he attached the dogs to a line and had them hauled up before being hoisted back to the surface, himself.

His attitude to animals sheds a bright light upon his character —although it certainly gave material to his critics. He disliked the necessity of killing penguins or seals and wrote: ". . . but necessities are often hideous and man must live." To him the necessity of driving dogs to exhaustion and death was a nightmare. "One cannot calmly contemplate the murder of animals which possess such intelligence and individuality, which have frequently such enduring qualities and which very possibly one has learnt to regard as friends and companions . . . to say that they (dogs) do not greatly increase the radius of action is absurd; to pretend that they can be worked to this end without pain, suffering, and death is equally futile . . . but the introduction of such sordid necessity must and does rob sledge travelling of much of its glory. In my mind no journey ever made with dogs can approach the height of that fine conception which is realised when a party of men go forth to face hardships, dangers, and difficulties with their own unaided efforts, and by days and weeks of hard physical labour succeed in solving some problem of the great unknown."

Scott's critics have labelled him queasy and make much of this humane side of his nature in questioning his ability as a Polar leader. They point to the fact that he could never bring himself to shoot one of his dogs and, on his own admission, blamed himself for leaving this grim task to his followers.

On the last tragic exploration, neither the dogs nor the Siberian ponies he took to Antarctica came up to his expectations. Several died as a result of the appalling weather conditions the party met during the three weeks it took them to get the *Terra Nova* through the pack, and of those which survived most were so weakened by the voyage that they never fully recovered. Yet it can be said that this was misfortune beyond the maximum that might be allowed for in the calculations of a man whose only other experience of getting through the pack had lasted less than one third of the time in fair weather.

That Scott had failings is beyond question, but they were the failings of a supreme individualist—and who but courageous individualists would have attempted what he, Shackleton, Amundsen and Byrd achieved? To the popular mind success is the only criterion of judgment; success is sufficient unto itself and needs no evaluation in plans laid, luck over-riding ill-luck, chances taken that go beyond calculated risks. Scott, himself, had learnt the value of that sort of judgment in the international acclaim that followed his first "Furthest South" expedition. For all his romantic leanings, he had an underlying shrewdness and a knowledge of the world and men. In writing of his own comrades at one point he makes the vivid remark:

" I do not think that there can be any life quite so demonstrative of character as that which we have had on these expeditions. One sees a remarkable reassortment of values. Under ordinary conditions it is so easy to carry a point with a little bounce; self-assertion is a mask that covers many a weakness . . . and so it is that commonly we accept people on their own valuation. Here (in

Antarctica) the outward show is nothing, it is the inward purpose that counts. So the 'gods' dwindle and the humble supplant them. Pretence is useless."

In spite of that clearness of perception, even the most loyal of his comrades will allow that in some ways his handling of authority was uncertain almost to the point of danger. In a venture that called for the heaviest physical work and the utmost endurance he would leave a great deal to be done by volunteers instead of planning and apportioning tasks fairly. Every member of his party was willing to give his best but, as a result of Scott's methods, the keenest did far too much and the strain upon them told.

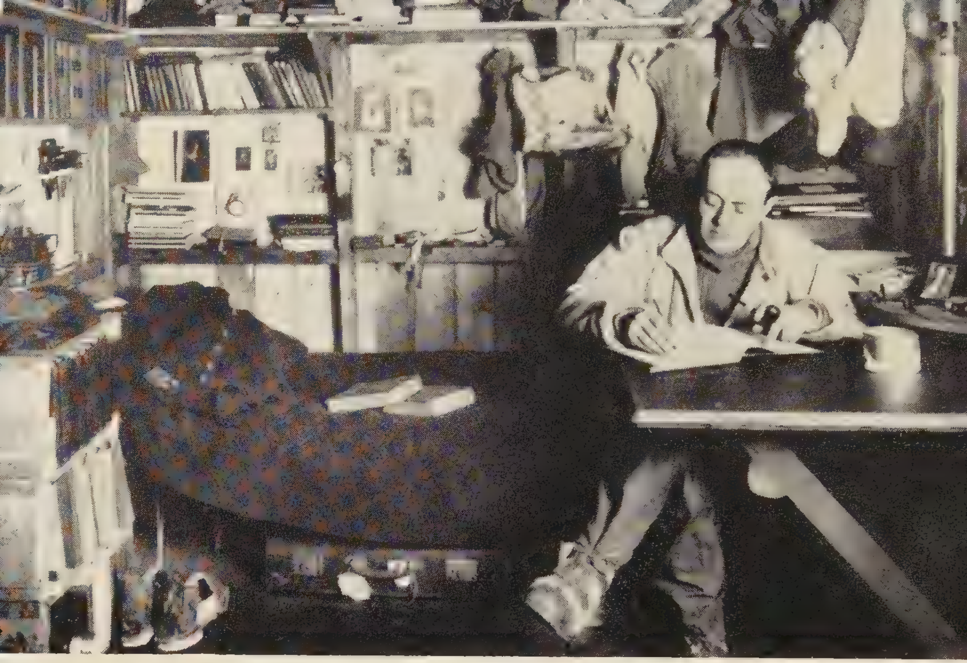
On November 2nd, 1911 Scott and his party set out for the South Pole. His first objective was to better the time and distance made by Shackleton who, in the meantime, had led an expedition further south than his own original attempt.

With an almost fanatical interpretation of the British code of sportsmanship, Scott had attempted to make no contact with Amundsen's party at the Bay of Whales, since their presence had by chance been discovered. In his view any kind of communication between the two expeditions might have embarrassed the Norwegians, made them feel that they were being overlooked, and given the impression that the British were willing to race. In this the contradiction in his character was most apparent. He was proud, and rightly proud, of the fact that the British expedition was very heavily committed to a programme of scientific discovery and investigation. This (again rightly) he rated of greater value to mankind than the feat of physically arriving first at the Pole. Yet his whole soul was concentrated in longing to be first at the goal—and every individual man of his party shared his desire. They, no less than he, were willing to go beyond all calculated risk to win the honour. Yet, in loyalty to their leader, not one of them questioned his rigid keeping to a plan which meant delay when another party was in the field.

Scott's entries in the log of that tragic last journey show his sense of urgency; in spite of their forced cheerfulness, however, they are tinged with a sense of foreboding. The final moment of black disappointment, for all the cool restraint of its writing, makes one of the most bitterly pathetic passages in recorded English.

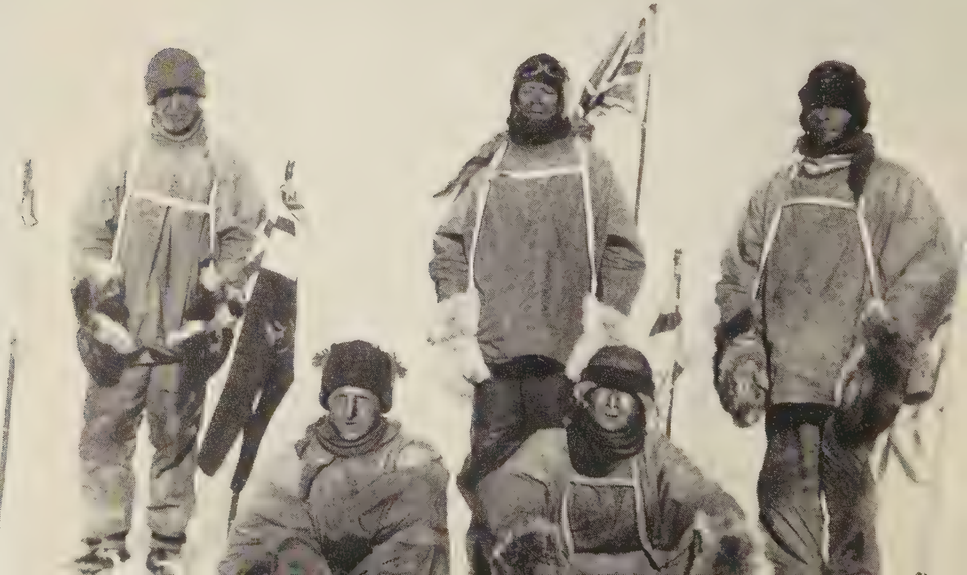
While Amundsen was moving fast and light with dogs only, Scott started with a much larger and more comprehensively

In full moonlight, the Barne Glacier towers above a frozen sea.



Above: Captain Scott entering details of another day's march in his journal.

Below: At the Pole. (Left to right) Oates, Bowers, Scott, Wilson and Evans. This "self-portrait" was taken by Bowers who released the camera shutter by a long thread.



equipped expedition in which his dogs were supplemented by ponies and motor-sledges. Here misfortune first struck. One motor-sledge had already been lost down a crevasse in the ice before the expedition was under way. The second cracked a cylinder before the expedition reached the first big camp on the Barrier ice—Corner Camp—and there the third failed for the same reason.

Lieutenant Evans, who commanded this section, now showed a fine power of leadership and personal physical endurance. He and his team hauled a heavy sledge from Corner Camp to 80 degrees South, and beyond, where they camped for twelve days to await the arrival of the main party. Evans and his men then continued onwards to the full extent of the Barrier section of the journey, covering a total of 350 miles before any of the others had started man-hauling at all.

Here again Scott has been called into question because he detailed Evans and Lashly to the last supporting party. This meant that men already very heavily taxed were allowed to take part in almost the worst part of the attempt. There seems to be no doubt that this immense, double effort contributed to Evans' collapse on the return journey, when only by the courage and fortitude of his two companions, Lashly and Crean, was he saved from death.

Meanwhile, the ponies were causing Scott continual anxiety and —in the knowledge of his deep humanity—an inner turmoil of conscience. Although snow walls for their shelter were built at every camp on the route, the poor animals suffered acutely. Blizzard snow is superfine; it got through the coats of the animals even beneath their coverings. This, of course, brought down their body heat, and they were consequently restless, with the result that the snow walls were often kicked down.

Oates, who was in charge of them, was selfless in giving them constant attention, and on one occasion during the march spent the best part of four days outside in their so-called stables. He explained afterwards that this was partly in consideration of his human comrades because he knew he would be dripping wet when he came into a tent, and would thus add to the general discomfort.

Scott reached to within a normal day's march of the Beardmore Glacier on December 3rd, the party having averaged about 14 miles a day up to that point. Then a southerly blizzard struck and they were held inactive for four whole days.

When respite came it was almost as bad, for the warmer weather brought driving sleet and slush. The surface over which men and animals toiled became one of their heaviest tests. The ponies sank in until their bodies were touching the surface and the men were forced to drive them mercilessly. The dogs were almost afloat. Fifteen hours later the ponies had to be killed.

By this time all the stores considered necessary had been carried to the base of the Beardmore Glacier, but the four-day hold-up in the blizzard had cost Scott dear. It meant four days' rations gone, extra to planning, in a schedule that was worked out in ounces.

Four more full-scale blizzards were encountered on that grim journey across the Barrier ice, up the ragged surface of the Beardmore Glacier and over the great Polar Plateau.

Day's party had been sent back on November 24th. Meares and the dog-team returned on December 12th from the lower glacier depot. On the 22nd, in the upper reaches of the glacier, Atkinson's party turned back. Lieutenant Evans and his two companions were ordered to return on January 3rd, 1912, when the expedition had reached to within about 150 miles of the Pole.

Evans was struck with scurvy when half way down the Beardmore Glacier on the return journey. Snowblindness added to his difficulties, but he kept on, covering up to 16 miles per day for another fortnight. At last he dropped in his tracks unconscious, whereupon Lashly and Crean hauled him on the sledge to the safety of Hut Point. Both men subsequently received the Albert Medal for their magnificent effort.

The actual Polar party now numbered five instead of four, as Scott had at first intended. With the leader were Dr. Wilson, Captain L. E. G. Oates and Petty Officer E. Evans (not to be confused with Lieutenant Evans). At the last moment Scott decided to include Lieutenant H. R. Bowers who, in his opinion, had been the greatest worker of them all.

This again is a point on which critics have seized with some justice. The whole organisation had been for four men. At the last moment Scott had decided upon five. Although every man of the supporting parties who had been ordered to turn back, up to that point, was deeply disappointed in having to forgo the honour of being in the actual Polar party, Scott said frankly that he could not bear to disappoint Bowers. In fairness, there is no doubt that he took a heavy risk by that decision.

Stolidly the five marched on over the plateau in a temperature reaching minus 22 degrees below freezing. In the order of march

Scott and Wilson skied in the lead, Bowers followed, and Oates and P.O. Evans brought up in the rear. Two days later they found Shackleton's furthest south camp, the weather was good and the leader's spirits began to rise:

" What lots of things we think of on these monotonous marches. What castles one now builds hopefully that the Pole is ours. We feel the cold very little and the great comfort of our situation is the excellent drying effect of the sun. Our socks and finnesko are almost dry each morning . . . we are south of Shackleton's last camp so, I suppose, have made the most southerly camp."

By the night of January 15th he was writing: "It is wonderful to see that two long marches will land us at the Pole. We left our depot to-day with nine days' provisions so that it ought to be a certain thing now, and the only appalling possibility the sight of the Norwegian flag forestalling ours."

Then came the two grim entries, heart-rending in their bleak restraint:

" Tuesday January 16th. . . . We started off in high spirits in the afternoon, feeling that tomorrow would see us at our destination. About the second hour of that march Bowers' sharp eyes detected what he thought was a cairn; he was uneasy about it but argued that it might be a sastrugus. Half-an-hour later he detected a black speck. . . . We marched on and found that it was a black flag tied to a sledge bearer; nearby the remains of a camp; sledge tracks and ski tracks going and coming and the clear trace of dogs paws . . . this told us the whole story. The Norwegians have forestalled us and are first at the Pole. It is a terrible disappointment and I am very sorry for my loyal companions. . . . Tomorrow we must march on to the Pole and then hasten home with all the speed we can compass. All the daydreams must go; it will be a wearisome return."

"Wednesday January 17th. Camp 69. Temperature minus 22 degrees at start. Night minus 21 degrees :

"The Pole. Yes, but under very different circumstances from those expected. We have had a horrible day—to add to our disappointment a head wind . . . temperature minus 22 degrees, and companions labouring on with cold feet and hands . . . great God! This is an awful place and terrible enough for us to have laboured to it without the reward of priority. . . . Now for the run home and a desperate struggle. I wonder if we can do it."

Scott's record of that grim day is without a touch of malice or envy of the men who had robbed him of everything for which he and his companions had risked their lives. Indeed, to Amundsen he wrote a warm tribute. In a tent upon which the flag of Norway was flying the party found a record of the men who had been there: Roald Amundsen, Olav Olanvson Bjaaland, Helmer Hanssen, Sverre H. Hassel and Oscar Wisting.

There was also a note which Scott opened as it was addressed to him.

" Dear Captain Scott, as you probably are the first to reach this area after us, I will ask you kindly to forward this letter to King Haakon VII. If you can use any of the articles in the tent please do not hesitate to do so. The sledge left outside may be of use to you. With kind regards I wish you a safe return. Yours truly, Roald Amundsen."

Carefully and justly Scott recorded the articles the Norwegian had left in the tent in case they might be of use to him: three half-bags of reindeer containing mitts, sleeping-bags, a sextant, an artificial horizon and hypsometers.

Then he, too, wrote a note and left it in the tent, telling of his visit with his companions. In his log he then records:

" We built a cairn, put up our poor slighted Union Jack and photographed ourselves—mighty cold work all of it—there is no doubt that our predecessors have made thoroughly sure of their mark and fully carried out their programme."

But if Scott was generous in accepting defeat, one of the Norwegians wrote later in no less a sense of chivalry and fair play. Helmer Hanssen stated: "It is no disparagement to Amundsen and the rest of us when I say that Scott's achievement far exceeded ours. . . . I do not believe men had ever shown such endurance at any time, nor do I believe there will ever be men equal to it."

On Friday, January 19th, Scott led his party away from the Pole to start a journey of 800 miles, man-hauling a sledge over the coldest and most difficult terrain to be found in the world. At first the weather was fair and the wind behind them, but before they had crossed half the stretch of the plateau the blizzards came down.

By the end of the month Scott knew that the situation was dangerous. Although the party were homeward bound, their disappointment had borne heavily upon them all. P.O. Evans was suffering from frost-bite and obviously beginning to weaken. This was alarming, for he was the tallest, the best-built and by far the strongest of the whole team, and on many occasions Scott had admiringly noted his tremendous endurance and never-failing cheerfulness.

By this date, as a matter of record, Amundsen and his party were not only safely back to base but were actually on board their ship *Fram*, steaming off to New Zealand.

On that day Scott records: "Wilson has strained a tendon in his leg; it has given pain all day and swollen tonight. Of course he is indomitable, but I don't like the idea of such an accident here. To add to the trouble Evans has dislodged two finger nails tonight; his hands are really bad, and to my surprise he showed signs of losing heart over it."

On February 4th misfortune struck again:

" Just before lunch unexpectedly fell into crevasses, Evans and I together . . . the party is not improving in condition especially Evans who is becoming rather dull and incapable."

Poor Evans had, in fact, struck his head heavily in the fall and was suffering from concussion. It was the second fall he had had in a short time, and there is no doubt that the combined effects cost him his life. By February 7th the party had crossed the plateau and were at the head of the Beardmore Glacier. All were weak; Wilson could not wear skis and could only march beside the sledge; Evans was "going steadily downhill". Yet Scott's sense of duty and his besetting interest in the scientific purpose of the expedition shine through the entry for the next day:

"Steered in for Mount Darwin to visit rock . . . we skidded downhill pretty fast, leaders on skis, Oates and Wilson on foot alongside sledge—Evans detached. We lunched at two well down towards Mount Buckley the wind half a gale and everybody very cold and cheerless . . . when we had advanced some miles and got out of the wind I decided to camp and spend the rest of the day geologising. It has been extremely interesting. We found ourselves on a perpendicular cliff of beacon sandstone weathering rapidly and carrying veritable coal seams. From the last Wilson with his sharp eyes has picked several plant impressions, the last a piece of coal with beautifully traced leaves in layers, also some excellently preserved impressions of thick stems showing cellular structure. . . . A lot could be written on the delight of setting foot on rock after fourteen weeks of snow and ice and nearly seven out of sight of aught else. It is like going ashore after a sea voyage. We deserve a little bright weather after all our trials, and hope to get a chance to dry our sleeping bags and generally make our gear more comfortable."

Poor Evans went from bad to worse. He started out trying to pull the sledge, but soon had to leave it and drop behind. Time after time the party stopped for him to catch up, but at last he was seen to fall. All four men went back to him on skis. Scott wrote:

"I was the first to reach the poor man and shocked at his appearance; he was on his knees with clothing disarranged, hands uncovered and frostbitten and a wild look in his eyes. Asked what was the matter, he replied with a slowed speech that he didn't know but thought he must have fainted. We got him on his feet but after two or three steps he sank down again . . . when we got him into the tent he was quite comatose. He died quietly at 12-30 a.m. . . . It is a terrible thing to lose a companion in this way . . . but the discussion of the situation . . . showed us what a desperate pass we were in with a sick man on our hands at such a distance from home."

The four survivors buried Evans beneath the snow, and struck out again, facing the last 430 miles of their journey. As they reached each depot which had previously been laid, however, the danger of their plight became more and more apparent. The food was well preserved, but much of the paraffin supplies had either leaked away out of the tins or had evaporated. This was serious indeed, and it was added to by the fact that towards the end of the month the thermometer fell to minus 40 degrees.

Oates' feet were now badly frost-bitten and there is no doubt that the whole party was stricken with scurvy. Without the possibility of hot meals, Oates suffered more and more. Soon he realised that he could no longer pull the sledge. Inwardly he knew then what his fate was to be, but he was troubled by being a drag on the others. He spoke of this in confidence to Dr. Wilson, who could do no more than encourage him to try to keep going.

Scott, however, realised the situation perfectly clearly and ordered Wilson to hand out opium tablets so that each member of the party could die in the peace of sleeping if death became inevitable.

By March 15th Oates had reached the end of his tether. He could go no further, but knew perfectly clearly that if he let his companions take up the extra burden of pulling him on the sledge they would have no hope at all. He begged to be left behind to die

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peacefully in his sleeping-bag, but neither Scott nor the other two would hear of it.

In his log Scott recorded: "The surface remains awful, the cold intense and our physical condition running down. God help us. Not a breath of favourable wind for more than a week and apparently liable to head winds at any moment. . . .

"Friday March 16th or Saturday 17th: Lost track of dates but think the last correct. Tragedy all along the line. . . . Poor Titus Oates . . . was worse and we knew the end had come. Should this be found I want these facts recorded. . . . We can testify to his bravery. He has borne intense suffering for weeks without complaint and to the very last was able and willing to discuss outside subjects. He did not—would not—give up hope until the very end. He was a brave soul. . . . He woke in the morning—yesterday. It was blowing a blizzard. He said 'I am just going outside and may be some time.' He went out into the blizzard and we have not seen him since. . . . We knew that poor Oates was walking to his death but though we tried to dissuade him we knew it was the act of a brave man and an English gentleman. We all hope to meet the end with a similar spirit and assuredly the end is not far."

Nevertheless, in recurrent blizzards and biting cold the three survivors staggered on.

On March 18th Scott records: "We have the last half-fill of oil in our primus and a very small quantity of spirit—this alone between us and . . ."

The following day: ". . . We have two days' food but barely a day's fuel. All our feet are getting bad—Wilson says my right foot is worse . . . amputation is the least I can hope for now . . . The weather doesn't give us a chance—the wind from north to north-west and temperature minus 40 degrees today."

Next day the blizzard struck again, and there was no hope then or on the day following of attempting a march. The One-Ton Depot, which meant life lay 15½ miles ahead, but, in the physical state they had reached, even in the best weather conditions it would have taken them three days to have covered the distance.

On the 23rd Scott wrote: "Blizzard as bad as ever . . . tomorrow last chance . . . no fuel and only one or two of food left—must be near the end. Have decided it shall be natural—we shall march for the Depot with or without our effects and die in our tracks."

Thursday, March 29th, Scott made his last entry: "Since the

23rd we have had a continuous gale, from west-south-west and south-west. We had fuel to make two cups of tea apiece and bare food for two days on the 20th. Every day we have been ready to start for our depot eleven miles away but outside the door of the tent it remains a scene of whirling drift. I do not think we can hope for any better things now. We shall stick it out to the end but we are getting weaker of course and the end cannot be far. It seems a pity but I do not think I can write more. R. Scott."

One line followed that entry: "For God's sake look after our people."

There, in the icy little tent, buffeted and shaken, filled with the thunder of the tearing blizzard outside, the three men drifted into their last sleep. Eight months passed before their solitude was broken by those who came and found them.

Wilson and Bowers were lying with their sleeping-bags closed. Scott's bag was opened. He had thrown back the flaps and undone his coat. One arm was flung across Wilson, the man who above all others had had his respect and friendship, and the rareness of his confidence. . . .

CHAPTER IV

On Scott's body were found not only his carefully and meticulously entered-up log and letters to his wife and kin-folk, but also letters which, even in his extremity, he had found strength to write to the relatives of his companions.

From his letter to his wife I take a clearly revealing paragraph in reference to his young son:

" Make the boy interested in natural history if you can; it is better than games . . . Above all he must guard and you must guard him against indolence. Make him a strenuous man. I had to force myself into being strenuous as you know—had always an inclination to be idle."

He also prepared a "Message to the Public" in which he answered his critics in advance. That message refers perfectly fairly to "misfortune in all the risks which had to be undertaken":

"(1) The loss of pony transport in March 1911 obliged me to start later than I intended and obliged the limits of stuff transported to be narrowed.

"(2) The weather throughout the outward journey and especially the long gale in 83 degrees south stopped us.

"(3) The soft snow in lower reaches of the glacier again reduced pace. . . . The Beardmore Glacier is not difficult in fine weather but on our return we did not get a single completely fine day; this with a sick companion enormously increased our anxieties . . . but all the facts . . . enumerated were as nothing to the surprise which awaited us on the Barrier. I maintain that our arrangements for returning were quite adequate and that no-one in the world would have expected the temperatures and surfaces which we encountered at this time of the year . . .

"It is clear that these circumstances came on very suddenly and our wreck is certainly due to this sudden advent of severe weather which does not seem to have any satisfactory cause. . . . We should have got through in spite of the weather but for the death and sickening of our companions and a shortage of fuel in our depots for which I cannot account and finally but for the storm which has fallen upon us within eleven miles of the depot at which we hoped to secure our final supplies. Surely misfortune could scarcely have exceeded this last blast . . .

"For four days we have been unable to leave the tents—the gale howling round us. . . . We took risks, we knew we took them; things have come out against us, and therefore we have no cause for complaint, but bow to the will of providence determined still to do our best to the last. . . . Had we lived I should have had a tale to tell of the hardihood, endurance and courage of my companions which would have stirred the heart of every Englishman."

In the months that passed before the tragic tent was found it was realised that he and his companions must have lost their lives. But even whilst the news of Amundsen's success was occupying the headlines of the world's newspapers, Scott's name lost nothing in the opinion of his countrymen.

It is said of the English that they admire effort more than achievement, and Scott's effort on his first Furthest South Expedition had shown that he was not reckless. We may love a foolhardy individual who manages to succeed, but we never respect him.

The manner of Scott's death gave almost a saintly quality to his enshrinement in the hearts of the nation. But behind the canonisation of Scott and his companions there was a less sentimental—if quieter—attitude among ordinary men of common sense.

It was asked then—as it is asked today—what is there in Polar exploration that can be of any possible benefit to humanity at large? The kindest people held that the value of any likely Polar discovery could not be worth the lives of such fine men. Those less kindly disposed said bluntly that, although Scott and his followers were heroically brave, they had really only adventured in order to win personal fame.

Scott, on his own admission, had sought "a goal" and had only by chance undertaken Polar exploration as a means of proving himself "more worthy". Romantic, undoubtedly, but it was asked in terms of hard logic, what was this other than a man's reckless determination to "make a name"? What good had it done to the world in general?

There are, said the logicians then (as they say it now), plenty of things a hero can still do in peace-time which would be of real value to mankind. There are men who volunteer for work in dangerous epidemic areas, men who offer themselves for painful and dangerous experiments in medical research. It is not difficult to suggest a list of such courageous and valuable occupations.

But, say the logicians with truth, things of this kind do not catch the public imagination. They may bring such heroes small obscure paragraphs in the newspapers—never the headlines. Yet, in comparison with what such men have done for humanity, with no public and little private acclaim, what have the whole company of Polar explorers achieved?

The questions are fair, and must be answered.

It is true that Polar exploration has provided practically nothing yet which an ordinary man of common sense would rate as of practical value to the human family. It is true that the results of Polar scientific investigation have not yet answered any question of world significance. It is true that the discoveries which Fuchs, Edmund Hillary and their colleagues have made while crossing Antarctica may not benefit the health or wealth of mankind for many years to come.

Yet it is equally true that when Faraday made the first electromagnet, when Rutherford discovered the atom, when Einstein propounded the little equation $E = MC^2$, no man of common sense—and very few of the highest technical attainments—could foresee the vast practical achievements would follow.

This is not just a convenient way of avoiding the question by saying: "Everything has to start in a small way. Therefore Polar exploration *may* prove to be of great value, in time." Nor is it a comparison beside the point. The work of the three men I mention above has a direct application to the future of Polar discovery. Their achievements, and those of many other scientists, made it clear that there were certain problems connected with the Polar regions the solving of which would be of enormous benefit to humanity.

Scott and the leaders of his time knew about these problems and realised the value that might lie in the answers. Their knowledge was, of course, sketchy. Although well-educated, intelligent men, they could not be rated as scientists. So they took scientists with them who set up the necessary instruments and apparatus and worked to a pre-determined programme of investigation.

They knew, even at that period, that the weather of the world is enormously influenced, if not controlled, by conditions at the Poles. If those conditions could be fully understood it was likely that weather-forecasting anywhere else could become an accurate science—and that, alone, could mean the difference between life or death for sea travellers, quite apart from its value to anyone, from a farmer to the organiser of a picnic party.

In Scott's day, the now vast science of electronics was no more than a microscopic phenomenon in a laboratory, but its potential was known by such men as Einstein and Rutherford. Information was wanted concerning the Auroras Australis or Borealis—those astounding displays of weaving luminosity which appear in the high skies of the Polar regions. Even then it was predicted that these were the results of high-speed atomic particles emitted from the sun and concentrating over the Poles by reason of the earth's magnetic field.

Information brought back on this subject co-related certain auroral effects with the gigantic flares, or explosions, which take place on the sun itself. This led to the study of sun-spot cycles—and from this vast field of investigation knowledge of the infinitely small world of the atom was advanced.

The early explorer-scientists naturally paid attention to geology, since perhaps the greatest excitement in the discovery of new land lies in the riches it may contain. This, however, gave their detractors further reason for criticism.

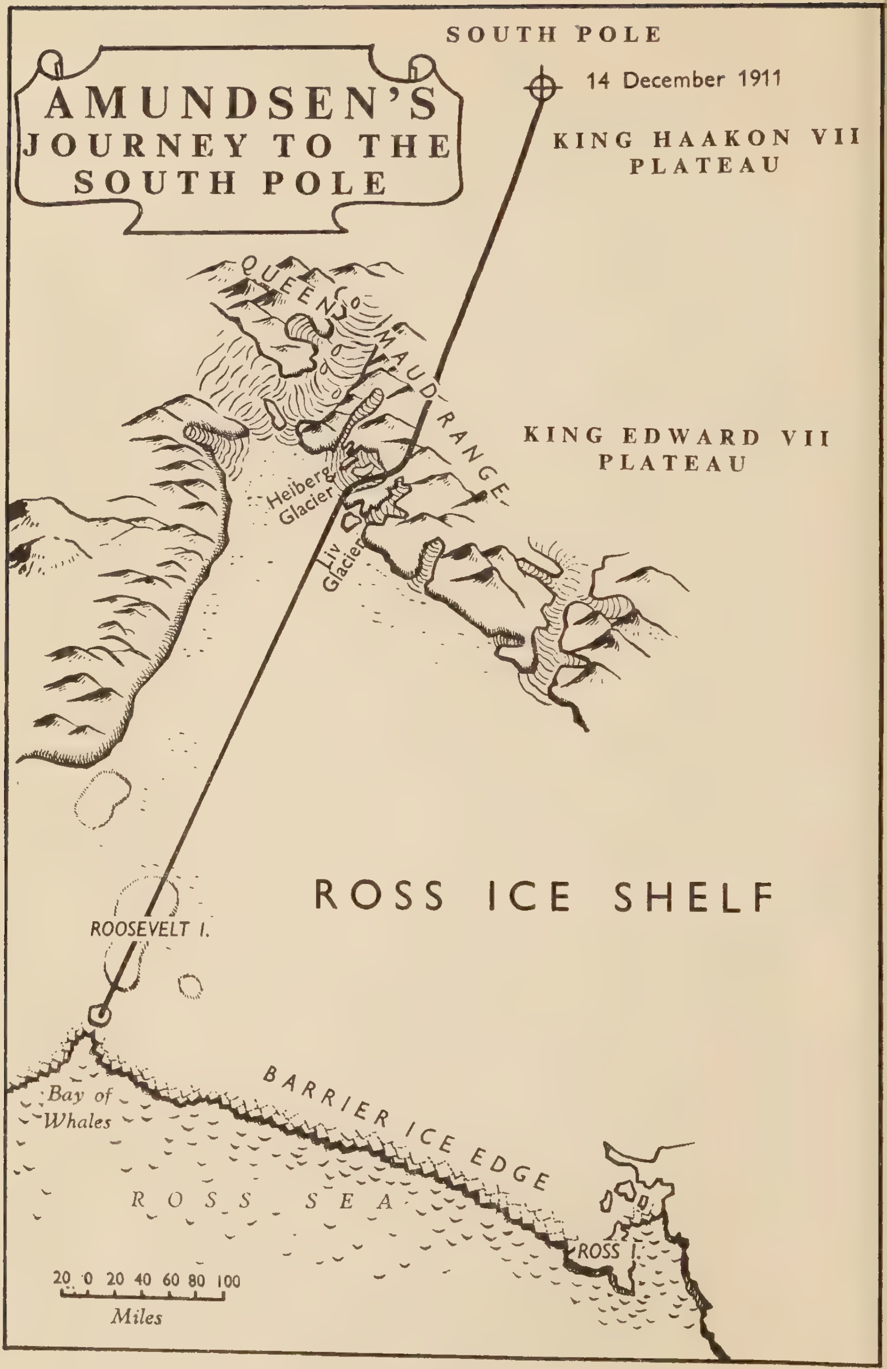
What, they asked—and still ask—was the use of coal, precious metals, or any other deposits found in Polar regions—since there was no means by which men could get them out?

In Scott's day, of course, the answer was obvious—none. Such deposits could only be regarded from the arid angle of discovery for discovery's sake. Now things look very different. The atomic furnace makes the future—and probably not the distant future—of mineral exploitation a quite practical possibility.

This and other matters which will make the normal common-sense man grateful for Polar exploration will be dealt with as they become a logical development of our story.

Part Two

AMUNDSEN



AMUNDSEN'S JOURNEY TO THE SOUTH POLE

CHAPTER I

For the moment, the crux of our story still lies in the characters of the men who gave themselves to its building. Of these, one of the greatest was Roald Amundsen. Although of an entirely different temperament from Scott, he was without question his match in courage and endurance. While Scott was an introspective dreamer who found his *métier* virtually late in life, Amundsen had been certain of what he wanted to do from early youth. For the whole of his adult life the business of exploring in Polar regions was more than a career: it was almost a faith to which he held with single-minded concentration, undeterred by any other influence or suggestion.

Born of a comfortable Norwegian shipping family in 1872, he was entered upon a training in medicine directly he was old enough. A quiet lad who thought much, he had some of Scott's solitariness but none of his uncertainty.

During holiday periods while still in his teens, Amundsen started training himself for the life he already, in secret, intended to live. The double bedroom windows of the stout Norwegian house in which he lived were always kept open, even when the thermometer was lowest. His object was not only to harden himself against cold, but to live with cold and learn how to thrive upon it. Before he was twenty, during a holiday period, he and a companion journeyed across the breadth of their snowbound country on skis. The period they chose was mid-winter.

The only reading Amundsen enjoyed was in books on Arctic and Antarctic exploration. The only people who could draw him into easy conversation were those interested in the same subject. At twenty-one he found himself a free agent after the death of both his parents. Without hesitation he threw over his medical studies. The next stage in his training for Polar work was quite clear in his mind. That was to go to sea.

Since his entire reading had been in books concerning his secret passion, he had what was probably a unique knowledge of the history of Polar exploration, and out of this he had formed a theory that the first equipment of a leader was experience and qualification as a ship's captain. So to sea he went, and eight years later qualified as mate on the ship *Belgica*, on which Lieutenant Adrian de Gerlache led an exploratory and scientific expedition to the Antarctic.

This was Amundsen's first baptism into the work of his life, and in it he certainly received the full test. The *Belgica* expedition was the first in history to winter in the Antarctic. The ship was caught in the ice-pack and drifted for a full year in the Bellingshausen Sea before breaking clear.

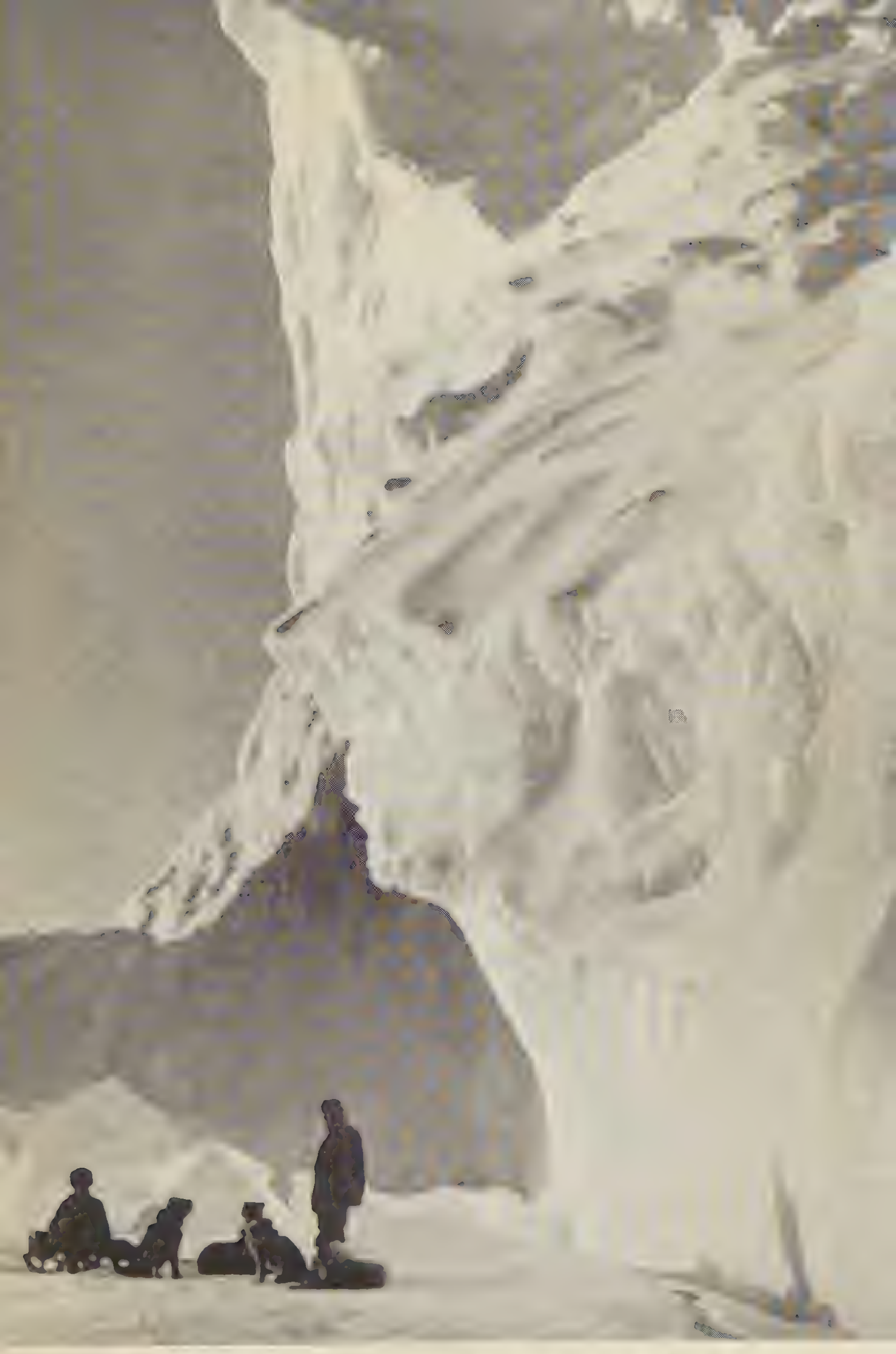
On his return to Europe young Amundsen was confident of himself and sure of his own powers of endurance. He had set himself a private goal. This was to sail north until his ship was frozen into the Polar ice which he believed to be in movement—and so allow the drifting ice to carry him across the North Pole itself. Before he could obtain the support which would make him leader of an expedition of that kind, however, he knew that he must get still more experience and make his name better known.

Accordingly, in June 1903 he captained a small expedition in a 45-foot ship, the *Gjoa*, with object no less than the discovery of the North Magnetic Pole and the fabulous North-west Passage. The voyage lasted for a year and eight months.

During that time Amundsen became the first man to provide proof that the North Magnetic Pole has no exact location. That is, the Pole constantly varies its position over a wide area. By this, of course, he made his name as a leader of exploration and as an accurate scientific observer. He added to his fame by finding the North-west Passage and sailing through it—through the islands of the archipelago north of Canada, into the frozen wastes of the Arctic Ocean—and so through the Bering Straits, down the Pacific coasts of Canada and America to San Francisco.

As a result Amundsen's fame was such that he had no difficulty in gaining the leadership of a North Polar Expedition, but the prize was lifted even while he was preparing to take it. The American Robert E. Peary reached the Pole after a wonderful march across the ice in 1909 whilst Amundsen was only in the process of laying plans.

Years later, he did attempt a Polar drift voyage in the North, between 1918 and 1920, without success. He was a man of astounding tenacity of purpose; once an idea had been formed in



Dog sledge from Scott's Expedition resting under lee of Castle Berg.

Roald Amundsen.

his mind nothing would remove it. This was his way with quite trivial matters, apart from the North Pole drift adventure which he gave up only after more than two years of the most appalling hardship and privation. By that time hard facts proved that his original surmise had been wrong; that the North Polar ice did not drift in the direction or at the speed he had originally imagined.

Amundsen had none of Scott's flexibility, nor, on the other hand, any of his inner uncertainty. Those who met him found him rather a grim individual, monosyllabic, "something of a bore". Probably only those of his own nationality—and at that those who were closest to him—knew the real fire of his nature, the reach and drive of his imaginative force; and the warmth of encouragement with which he could enhearten those whom he knew to be worthy of it by their capacity for great effort.

His decision to try for the South instead of the North Pole in 1911, Amundsen kept to himself. It is said that he did not even tell the members of his expedition of his change of plan until his ship, *Fram*, had left harbour and was under way. His explanation was brief and logical. Funds had been raised for the attempt to reach the North Pole, but in the meanwhile the American, Peary, had reached the goal. A second expedition so soon afterwards would therefore only be an anticlimax. However much it demonstrated the courage, skill and endurance of an expedition, it would be regarded as unimportant by the world in general.

Amundsen therefore defended his right to use funds raised for the Northern attempt in a venture to the South. Those funds, he said, shrewdly enough, had been subscribed by men whose first desire was to see honour brought to their country. Since a Norwegian had been the first to set foot upon the continent of Antarctica, what greater honour could there be than that Norwegians should be first to raise their country's flag at the South Pole?

Certainly, Captain Scott was already embarked upon the same attempt—he had left England a month earlier with a very much larger party—but that was no reason against anyone else trying for the same honour. Only a very small section of Antarctica was British by explorational claim. There would be no need for his party to tread upon any part of that territory. They could make their base at a point which lay in no other country's domain and plot their route to the Pole in an entirely different direction from that which Scott was known to have planned.

Moreover, he intended to be quite fair to Scott, and had already sent a cable announcing that he was also in the field.

His men already had some idea of his intention, since their weeks at sea had been steadily carrying them southward into a warm instead of frigid climate. Indeed, there had been questions amongst them and considerable discussion about certain items in their equipment, especially the pre-fabricated parts of a large and strong hut which did not seem to have any special use for an expedition due to remain ship-bound for months on end during a drift in north Polar ice. But even those closest to Amundsen always knew better than to press questions he did not wish to answer.

It was without question, however, that his entire party enthusiastically fell in with the new venture. So in 1911 the great South Polar race was on. For Amundsen it was a race in which luck favoured him at almost every turn with the same regularity that it frowned upon the heroic but doomed Scott.

The *Fram* got through the ice-pack in fair weather in only nine days, and the expedition landed at the Bay of Whales on the Ross Barrier on January 9th, 1911. Stores were put ashore and the hut was erected by the 21st. In spite of Shackleton's success with ponies three years beforehand, Amundsen had decided against them and concentrated upon Greenland dogs, of which he had brought 116.

With these, and with all the members of a Polar party on skis, he reasoned that he would have the advantage of speed. There was also the fact that, although Scott had reached Antarctica nine days before him, a dog-hauled expedition could start for the Pole earlier in the season than one which included ponies.

In the first few weeks, however, the dogs provided such a problem that everyone in the party began to wonder if they had embarked upon a foredoomed failure.

When harnessed to the sledges the animals were hopelessly intractable and seemed to have no idea of pulling together as teams, or any capacity for learning. They fought constantly among themselves and had to be whipped apart, tumbling and rolling in wildly-tangled traces which their cursing masters had to unravel with frostbitten fingers. Even when they had been got into some semblance of pulling-order they would constantly run amok at unexpected moments.

Amundsen, in his own later account, admitted that in those early days of the expedition he feared the dogs might well mean death to the Polar party—he knew what would happen if they became unmanageable when he and his followers were hundreds of miles deep in the icy wastes of the Antarctic.

Yet when everyone concerned was at the very limit of exasperation the dogs suddenly began to improve. Sledge-drivers began to achieve straight courses in the way they intended instead of veering off on any wild course and over-running or over-turning in a clamorous upheaval of snarling and snapping jaws. All the dogs seemed not only to understand the work at the same time but to accept their task and work at it with a will.

From then on they became disciplined teams, running and hauling with such effect that Amundsen afterwards gave them level credit with the men for the success of the expedition. It was in this connection, incidentally, that he took offence at an imagined slight so trivial and absurd that, as we shall see, it set the whole world laughing.

A point necessary to emphasise here is that the dogs were not turned into disciplined working teams by being lashed into cowed subjection. That could, of course, have been done, but it would have made them almost useless for their purpose. No beaten and spiritless animal, goaded only by fright, can cover the long distances day after day through appalling conditions in the manner required of a Polar team. In such circumstances an animal must work with its heart as well as with a healthy body, and no beaten and frightened animal is ever healthy.

Amundsen managed to lay his first depot at 80 degrees south by the middle of February (it will be remembered that Scott, owing to overwhelming difficulties and a three-day blizzard, was forced to lay his own first depot 36 miles short). Amundsen had the weather with him and also carried a bundle of light, flagged, bamboo poles with which he marked his route as he went along. Subsequently, when the supply of these poles gave out, he had the ingenious idea of marking the route with his supply of dried fish. The fish, of course, kept in perfect condition when stuck in the freezing surface, and by reason of their colour were visible against the snow.

On his subsequent depot-laying journeys to 81 degrees and 82 degrees Amundsen and his party had their first ill luck with the weather. They found appalling surfaces and were brought to the limit of endurance. By the time these depots were laid they had lost eight dogs, and of this period Amundsen afterwards wrote: "This was the only dark memory of our stay in the South."

On April 19th the sun sank, not to be seen again until August 24th, while the long night of the Antarctic winter dragged upon its way. Throughout this time Amundsen's party was no less inactive than that of Scott, who knew, as has been said, that his rivals were in the field and established at a point much nearer the Pole. The Norwegians, however, were in no uncertainty as to plans. They were out to get to the Pole, and to get there first, directly conditions were possible. Meanwhile, they set about their own scientific observations and investigations, especially those concerning magnetic effects—a subject always dear to Amundsen's heart. A delay threatened this work at first in an enormous snowdrift which piled up eaves-high against the hut and which none of the party relished having to clear.

Amundsen tackled the problem by adding ingenuity to hard physical work. Instead of trying to clear the snowdrift, he and his men set out to burrow into it from inside the hut. In doing so they made themselves a large, weatherproof extra room cut out of the snowdrift itself. This gave much-needed extra space for special work that had been planned. In the snow-room the party made themselves four special sledges, ultra-light and designed for the final march. These were 12 feet long, unshod, and without steel runners. Each, at the finish, weighed 110 lb. less than the normal sledges they had brought with them—and indeed it is to these lightweight sledges, almost as much as to good fortune with the weather, that the success of the final journey can be attributed.

With the return of the sun at the end of August there was trouble again with the dogs. After four months of comparative inaction they had forgotten much of their earlier training. When depot-laying was started again there was the same story of erratic running and fighting in the traces before they could be brought back to discipline. But after their first experience the party had confidence, although until the end of September the cold was intense and the task almost heartbreaking.

In the first days of October the rising temperatures and the movements of the seabirds heralded spring. Another three weeks of hard training, and the dogs were once again well in hand. Then on October 19th, the journey to the Pole was begun.

In the order of march, Helmer Hanssen, who had proved himself beyond all compare as a handler of dogs, led the way. Olav

Bjanland came next, with Sverre Hassel following, while Oscar Wisting and Amundsen brought up in the rear. The four sledges each had a team of thirteen dogs, and all the men were on skis.

Although the start was made in fog and indifferent weather, the speed was excellent and the party covered 99 miles in the first four marches, whereupon Amundsen ordered two days' rest, during which the sledges were repacked and lightened of their loads. At the restart Amundsen decided to lead, but Hanssen's dogs, tired of inaction, went away at such a pace that they over-ran the leader and brought him down. In the wild tangle of whirling traces, plunging paws and snapping teeth—since the incident gave the dogs good excuse for a general free-for-all fight—Amundsen was rescued by followers half-helpless with laughter. He admitted in his later records that he decided, then and there, never again to have a dog-team behind him.

CHAPTER II

THE run across the great Ice Barrier to the first out-croppings of solid land was completed by November 15th in weather conditions that—having regard to the Antarctic weather—can be described as perfect. Here the party were faced with the ascent of the Devil's Glacier on to the Polar Plateau itself. Their distance from the Pole was over 340 miles, starting with a climb of some 10,000 feet. This climb proved to be the toughest experience of the whole journey, although the weather still remained benign. As the party toiled up through the massive, jagged ice-fields they were beset on all sides by crevasses; and they were conscious of the thunder and vibration of avalanches constantly sliding down and crashing into the depths from the peaks about them.

Now the dog-teams showed at their very best. Time after time they were straining flat down in their harnesses, digging in their claws, sometimes moving their sledges only inch by inch as the drivers toiled and yelled. In the course of one morning the whole expedition gained a distance of only 70 yards.

At a point about half way up to the plateau one of the most distasteful necessities of the whole attempt had to be faced—and carried through. For the sheer requirement of providing enough food, twenty-four of the dogs had to be killed. Amundsen had no more stomach than Scott for this but, as with both expeditions, it was a known factor which had had to be included in the planning.

By necessity the sacrifice was taken from the weaker of the loyal and hard-working animals, and the men who dispatched them loathed their task.

As though in sympathy with the unfortunate dogs so scurvily rewarded for their loyal efforts, the weather changed. For the next four days the party were held in their tent by a raging blizzard. At last, depressed beyond measure by what they had had to do, they reached a mood of recklessness. Sensing this, Amundsen put the question of restarting to popular vote when, on the fifth morning, they woke to find a northerly gale still raging.

The vote was to chance everything, gale or no gale, and get away from that place of butchery. Accordingly, the remaining eighteen dogs were harnessed-up and were soon racing away into a thick fog which came down as the wind dropped. By mid-day Amundsen called a halt. The mood of the men and dogs seemed crazed. Time after time they had been racing down slopes at full speed, blind in the fog, reckless of whatever chasms or treacherous ground might be lying ahead. By allowing this any further, he would be courting disaster; for at this point, hundreds of miles from base, an injury to one man might easily cost the lives of all.

Here again the luck ran freakishly in his favour. Before a meal had been eaten the fog cleared and the sun came out. And from then on, with the exception of short blizzards and a few patches of gale, the entire journey was accomplished in fair weather.

Throughout the journey the principle of trail-marking, so that no stops would have to be made for navigation on the return journey, had been carefully carried out. As from 80 degrees 25 minutes south, Amundsen built snow beacons at distances of about 5 miles apart, which were continued to the Pole itself.

By December 7th the party had passed the furthest south reached by Shackleton—88 degrees 23 minutes. They left their own last depot at 88 degrees 25 minutes, and on the 13th of the month made what they knew would be their last camp before the goal.

In Amundsen's own record he describes this, the camp at 89 degrees 45 minutes, with the phrase: "The atmosphere of the tent that night was like the eve of some great festival." Apart from attacks of frost-bite, all the men and the dogs were in first-class fettle. The party knew now that the great prize was within their grasp. Since strict honour had been observed between both expeditions and neither had in any way tried to overlook the other, they had no idea how far Scott was upon his way. But in these last days of the march, when the projected tracks drew close together, they had seen no signs of human activity. That they were first in the field was an absolute certainty. Next day there came full proof.

After an early start and a flogging march, Amundsen halted the party at 3 p.m. with a raised arm and a shout. His sledge-meter told him that the distance was right. Careful check of his navigational figures left no further doubt. He and his men stood upon the point of the South Geographical Pole.

As was only natural, there was delighted handshaking, excited laughter, and then everyone was busy about the erection of a tent and the hauling up of the Norwegian flag—in doing which Amundsen insisted that each member of the party should have a hand upon the halyards. In order to be doubly assured, he led the party another 5½ miles further south and erected a tent, where all navigational figures were again carefully rechecked. There the expedition camped for four days, provisions were repacked, and a proportion left behind together with one sledge. Then, having left his letter for Scott, Amundsen turned for home.

Once again in his record, his queer character is shown.

"I cannot say, although I know it would be found more effective, that the object of my life was attained. That would be romancing rather too barefacedly. I had better be honest and admit straight out that I have never known any man to be placed in such a diametrically opposite position to the goal of his desires as I was at that moment. The regions around the North Pole—well, yes, the North Pole itself—have attracted me from childhood and here I stood at the South Pole. Can anything more topsy-turvy be imagined?"

Can any mind be imagined more tenacious than that of Amundsen? Can anything be imagined more bitter than Scott's discovery of the Norwegian tent when he came to that place a month later? One may be glad that poor Scott was never to know that he was beaten by a man whose fixity of purpose was such that he regarded the achievement as not much more than a side-issue to the dedicated direction of his life.

Most of Amundsen's return journey was made by night to avoid the discomfort of marching with the glare of the low sun directly in the eyes. He found his marker-beacons an immense help and only missed finding one of them throughout the whole journey.

Christmas Eve was spent at the 88 degrees 25 minutes depot, where Bjaaland produced cigars which he had carefully hoarded throughout the whole trip, and the party had a "royal dinner of porridge".

The descent from the plateau started on December 28th, the dogs "going like the wind". Wisting had rigged a sail on his sledge, and Amundsen admits that he found it all he could do to keep up on his skis. Again by good luck the party found a reasonably easy pass through the worst broken ice of the glacier—an almost level stretch they had entirely missed on the way up.

From this point Amundsen altered the routine to a march of 15 miles, a rest of six hours, another march of 15 miles and so on, which was kept up regularly. On January 6th the expedition had got down from the plateau on to the Barrier ice after only fifty-one days on the land itself. They now had eleven dogs left, and with those eleven they finally arrived back at the base hut on January 25th, all fit, dogs and men, and in the highest spirits.

However much luck had favoured him, Amundsen had organised and led an epic expedition which had covered 1,860 miles across the most difficult and dangerous terrain on earth in only ninety-nine days.

There followed almost immediately a tiny incident of ridiculous comedy of the sort in which Amundsen so often found himself. When the party went aboard the *Fram*, the ship's company were naturally not expecting them. As the explorers stood in the small cabin exchanging greetings and accepting glasses of aquavit, neither the captain nor any of the others knew if they had succeeded or failed.

With true Norwegian politeness, none of them liked to ask outright the question that was in all their minds. On the other hand, Amundsen did not care to boast in any way before men of his own kidney who had his respect and trust. Therefore he rather uncertainly engaged in small talk, and the members of his party followed his lead. But at last conversation dwindled and died.

Whereupon one of the ship's company took the bull by the horns. After a nervous cough and an effort to appear casual, he inquired, "Been there?"

His two simple words acted like the touch-paper to a firework. Almost before he had finished speaking, Amundsen and his party were roaring with laughter, holding their sides and collapsing on to settees. Then they were all gasping out their wonderful news. The ship's company yelled with delight and began laughing too. In a moment the cabin was a scene of idiocy—of be-furred and sea-booted men embracing each other, pounding each other's backs, hopping in ungainly dances and generally roaring triumph.

While this scene was enacted, Scott lay writing in his tent more than 900 miles deep in the Antarctic solitudes the Norwegians had left behind them. He had reached the Pole, endured the bitterness of frustration, and turned back.

On that evening he wrote: "Only eighty-nine miles to the next depot, but it is time we cleared off this plateau. . . . Oates suffers from a very cold foot; Evans' fingers and nose are in a bad state and tonight Wilson is suffering tortures from his eyes. . . . I fear a succession of blizzards at this time of year . . . blizzards are our bugbear, not only stopping our marches but the cold damp air takes it out of us . . ."

CHAPTER III

AMUNDSEN'S destiny was to lose his life as heroically as Scott—but by the quirks of his nature, he could never keep his dignity. His dogs formed one of the greatest interests of his life. He was fascinated to see that, when the eleven survivors of the polar journey were taken back on board the *Fram*, three trotted straight away to their normal kennels on board and dropped down, re-establishing ownership. Two more immediately started a snarling game in a special corner of the deck they had always favoured for such pleasantries on the voyage out. One, whose harness-mate had been killed, pathetically roved the ship trying to find him.

Amundsen always mentioned this in the lectures on the expedition which he afterwards gave in Europe and America. He stressed the wonderful work that the animals had done and said, in agreement with Scott, that he could not bring himself again to forfeit the lives of such courageous loyal creatures for any achievement.

At the end of one such speech given at the Royal Geographical Society in London, Lord Curzon rose to propose the usual vote of thanks to the lecturer. The words he used might have been more tactfully chosen. Curzon, indeed, had a manner that was never endearing to those who had not inherited title. In any case, he finished his speech by calling the audience to their feet to give "Three cheers for the dogs".

Amundsen flushed brick-red and was obviously beside himself with fury. There is no doubt that he thought, if only from Curzon's patronising manner, that the English lord was making little of the expedition, and had finished up by trying to make it appear ridiculous in calling for cheers for the dogs instead of the men.

No one could make him see either the pettiness or the unimportance of the incident. He wrote a furious letter to the Society demanding a public apology. Those in authority wrote back placatingly but saying with good reason that they felt that the slight was more imagined than real. Still Amundsen refused to be mollified, and forthwith resigned the honorary membership to which he had been elected. Moreover, none of his friends ever dared mention Lord Curzon's name in his presence for the rest of his life.

Meanwhile, the rigid tenacity of his mind still held him to his project of drifting across the North Pole. The first World War was being fought out at this period, and it was impossible for him to start. Since his country was neutral, and the neutral countries were coining money out of supplies, he went into business. By 1916, by dealing in shipping, he had amassed a fortune of £50,000. The whole of this he sank in financing his North Polar Drift expedition, which he attempted two years later.

In this he failed, and was almost penniless when he went to America to try to raise funds for a flying expedition—over the North Pole, of course. Both fortune and judgment seemed to desert him in this project. He gave power of attorney to an American promoter who undertook to get his expedition launched. The promoter not only failed, but ordered a mass of equipment in Amundsen's name for which the explorer could not pay.

As a result of this and the fickleness of public opinion, Amundsen found himself discredited and generally looked upon as a man of questionable honesty and sharp dealing. He was reduced almost to the amount necessary to settle a last week's hotel bill when his astounding luck changed again.

A man whose name he did not know and whom he had been avoiding—in the fear that it was another request for money—at last wore down his patience so much that, in answer to a telephone message, he agreed to an interview. That man proved to be Lincoln Ellsworth, an heir to millions, who opened the interview by announcing that he would bear the whole cost of a transpolar flying expedition if the great Amundsen would only allow him to join the adventure.

Ellsworth proved as good as his word. He bought Amundsen two big Dorniers, paid all expenses and took part in the final flight. The attempt ended with the forced-landing of both aircraft in the Polar ice-fields, but the whole party managed to get back safely by crowding into the one machine which could be made serviceable.

That Ellsworth was no mere pampered child of fortune, keen on a thrill, was proved by the fact that this experience—which nearly cost him his life—in no way daunted his courage. Although born in such different circumstances from Amundsen, and of an entirely different temperament, he was genuinely dedicated to exploring and to aviation.

Immediately after the abortive Polar flight Lincoln Ellsworth bought for £15,000 an Italian airship, designed and built by Colonel Nobile, and presented it to Amundsen—with the only stipulation, again, that he should form one of the party on a second attempt to fly over the Pole.

Amundsen jumped at the offer. He had long thought that the airship rather than the aeroplane was the better vehicle for such a voyage, but hitherto he had despaired of being able to raise enough funds. He agreed to Colonel Nobile being the pilot of the airship, which was christened *Norge*. This appointment was a matter of common sense, since Amundsen himself had never handled an airship, although he held an aeroplane pilot's licence. Yet he naturally regarded himself as the commander and guiding spirit of the expedition, and almost from the start he and Nobile were at loggerheads.

The Colonel wanted to reach the Pole but, should the airship find bad weather conditions there, he proposed to turn back for the home base at Spitzbergen. This was not enough for Amundsen, who wished to survey a whole trans-continental Polar route, and insisted that the journey should be from Spitzbergen clear across to Alaska.

While the two were still squabbling and the airship was at Spitzbergen, the American Admiral Byrd and his pilot Floyd Bennett actually flew to the Pole and back in an aircraft.

This decided Amundsen, once and for all. He over-rode all Nobile's objections—and in the event, the Norge airship made one of the most historic flights in aviation history. The voyage covered 3,391 miles in seventy-two hours from Spitzbergen straight across the North Pole to Teller, Alaska.

By the time it was finished, Amundsen and Nobile were no longer on speaking terms. They afterwards quarrelled bitterly on public platforms and in the popular Press. Amundsen stated that Nobile had been no more than his paid employee, responsible only for the flying and control of the airship. Nobile claimed that it was he who had actually laid out the route and carried out the navigation.

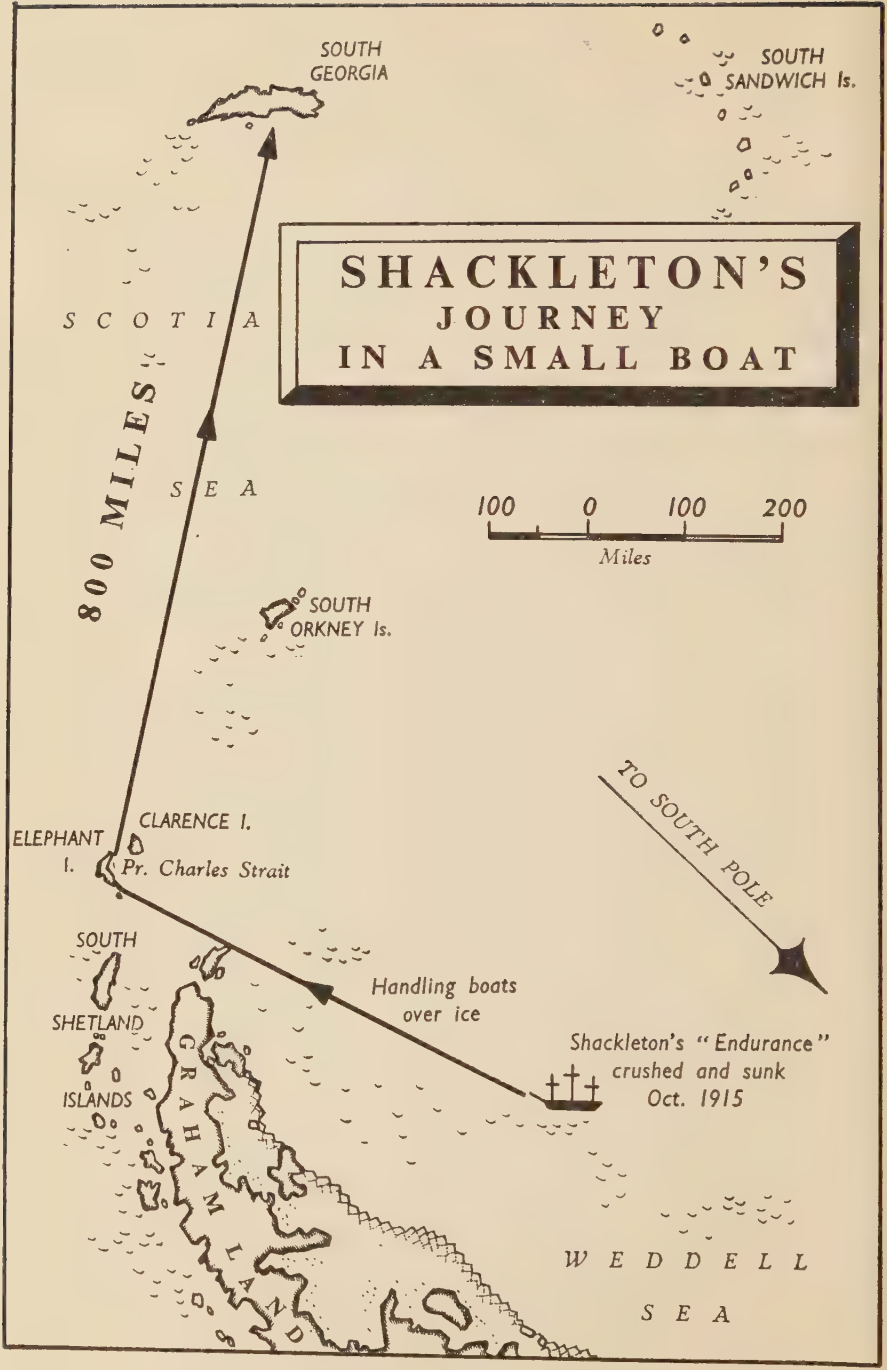
Feeling between the two men was still hotly and furiously antagonistic when Nobile set off for the Pole again in another airship, but crashed amidst the ice-floes.

Amundsen then showed the true greatness of his character. In spite of the bitter quarrels and hot words which had passed on both sides, he joined in the rescue operations without hesitation. With the French Captain Gilbaud in a Latham aircraft and with a crew of four, Amundsen took off and flew into the Polar wastes as soon as the machine could be made ready.

Neither he, Gilbaud, nor their crew were ever heard of again—although Nobile, and the greater number of his followers, survived.

Part Three

SHACKLETON

SHACKLETON'S JOURNEY IN A SMALL BOAT
SOUTH GEORGIA
SOUTH SANDWICH Is.
SCOTIA SEA
800 MILES
100 0 100 200
Miles
SOUTH ORKNEY Is.
TO SOUTH POLE
CLARENCE I.
ELEPHANT I.
Pr. Charles Strait
SOUTH SHETLAND ISLANDS
Handling boats over ice
Shackleton's "Endurance" crushed and sunk Oct. 1915
GRAHAM LAND
WEDDELL SEA

CHAPTER I

LONG before Amundsen died so tragically with Gilbaud and his crew the eventual course of Polar exploration was changed by the greatest visionary of them all. His name has already appeared in this record—Ernest Shackleton, the turbulent Irishman who had been invalided home from Scott's expedition of 1901. Like many another original, his ideas were "before his time". More than forty years were to pass before the mechanical and electronic equipment available today made his great conception a possibility.

Shackleton was a tall man with a magnificent breadth of shoulder. When I first met him, I was a schoolboy of thirteen. Because all things loom larger in one's youth, I saw him as a very giant, a genial Irish giant, handsome in the tough way of a born sailor. His laugh was easy, his eyes very bright, and the aura of recklessness seemed to surround him.

I still think I should have gained that impression even if I had not known that he was the great Sir Ernest Shackleton who had got nearer to the South Pole than any other man before him—and who, at the time of our meeting, was planning a still more ambitious expedition.

The occasion was a lecture he had just given on Antarctica, after which there was an informal meeting to which I was taken by a relative. Of the lecture I remember almost nothing, but of the personal meeting, the handshake and the crisp, strong voice my memory has always been very clear. One phrase I can almost hear him saying now. It came when he answered someone in the group who spoke of the risk he was facing in his new expedition—a new hazard at a time when he was world-famous and loaded with honours.

Shackleton laughed abruptly. He said something of his difficulties in raising finances for the attempt. Then he added: "Put it this way. There are two points in the adventure of a diver. One, when a beggar, he makes his plunge; two, when a prince, he rises with his pearl."

I remember the laughter that followed, the scent of cigar-smoke, the sense of adventure in being in the company of men all much taller than I, and all richly adult in their white shirt-fronts and black clothes.

The quick picture that Shackleton drew that evening, however, was largely the measure of his own character. No two people could have been more dissimilar than he and Scott. He was the storybook adventurer to the life; big, bright-eyed, easy-going and breezy—and not above occasionally playing up the part of the jolly Irishman.

In actual fact, as his own writings show, he was highly intelligent, imaginative and a shade superstitious. Physically he was as tough as he looked, with tremendous reserves of endurance. Although, unlike Scott, he had the common touch and easily won the affection of followers, he knew how to discipline them, and discipline them hard.

On two points he was a bullying martinet. First he insisted on optimism; he would have no grousing, whatever the circumstances, and his temper would flare up at the sight of long faces. Secondly, he would permit no quarrels. At the opening of any squabble he would be down upon the men concerned and both would get the raw edge of his tongue—which could be very raw indeed. Then he would use an uncanny ability to expose the weakest point in each man's argument and make each of them admit it. Since there are inevitably weaknesses on both sides of any argument, his nimble mind soon had both men making grudging admissions. Then, with his overwhelming personality, he could demand a handshake and order the subject to be dropped from that moment forward.

To every man who ventured with him, Shackleton's greatest attribute was his forthright honesty. Men of tough physique and high physical courage are never easy to handle. Shackleton's grip on them was sure, not only because he was the match of the best of them, but because his fairness as a leader inspired them with a complete trust in his decisions. Moreover, as an unruly soul himself, he had an amused understanding of unruliness in other men of spirit, and he knew how to handle it.

Born in Kilkie, Ireland, in 1874, Shackleton was brought by his parents to London and entered at Dulwich College. Having no stomach for the professional career intended by his parents, however, he ran off to sea, but although a wanderer by nature, there was nothing of the wastrel about him. He had gained his Master's ticket in the Mercantile Marine and the rank of Lieutenant in the Royal Naval Reserve when Scott chose him as one of his team for the 1901 Polar Expedition.

The only uncertainty or introspection he ever showed came after he had, perforce, been invalided home from that venture. He felt that his courage had been called into question. He feared that the world thought he had been malingering, in order to dodge his duties. As a result, once he had recovered he was almost fanatical about the business of raising funds and organising an expedition of his own.

His easy trick of making influential friends in high places brought him the Secretaryship of the Royal Scottish Geographical Society. On Antarctic matters he proved himself to be a fluent as well as an expert lecturer, as a result of which he won the confidence of men of wealth.

By the middle of 1907 he had found enough financial backing to buy a 200-ton sealing schooner, the *Nimrod*, which he re-rigged as a barkentine. He appointed Frank Wild, a veteran of Scott's first expedition, as second-in-command of a carefully-picked team and sailed for New Zealand in August of that year. In Australia he was joined by Professor Edgeworth David of Sydney University, and Douglas Mawson who, in the years to come, was destined to win personal fame for a magnificent exploration of the interior of Wilkes Land.

The full expedition left New Zealand in the *Nimrod* on New Year's Day, 1908, carrying Manchurian ponies instead of dogs, and general equipment to last something over a year. In the course of that year Shackleton far eclipsed Scott's earlier achievement. In order to save fuel, he had the *Nimrod* towed to the Antarctic Circle before lighting her furnaces and taking her onward under her own steam.

At first the luck was against him, and a gale which raged for ten days brought down the condition of the ponies, one of which broke a leg and had to be shot—in the circumstances, a very serious loss. A worse difficulty faced the expedition when they reached the ice-cliffs of the Ross Barrier. Shackleton had promised his old leader that he would not use the original base at Hut Point, but after a cruise along the Barrier it seemed to be the only possible place.

At first Shackleton made a survey of the bay in which he and Scott had landed and made their flight in the captive balloon, but it was too exposed for a permanent anchorage, and in addition there were clear signs that the ice was calving and breaking away. Everywhere else he surveyed proved equally unsuitable, and at last he had to make for McMurdo Sound. Even so, he kept his promise to Scott as rigidly as he was able, and set up his base at Cape Royds, a clear 20 miles from Hut Point. This meant that he was further from the Pole than Scott had been by at least two days' march, a price only a rigidly honourable man would pay in keeping his word.

Shackleton's base was overtowered by the 13,000-feet high active volcano, named Mount Erebus by Sir James Clark Ross, who had first discovered it in 1841. From the time of landing, Professor David longed to climb the peak. He foresaw possibilities of geological discovery at the actual crater edge, and his scientific mind was hungry for temperature-readings and wind-current details which, taken from that position, might well have a bearing on the general mystery of Antarctic weather conditions.

At last he persuaded Shackleton to let him lead a party in the attempt, although it had not been planned and would use up supplies and put men to added hazard. It says much for Shackleton's flexibility of mind that he finally gave permission. His personal aim and ambition was, first, to lead a party to the South Geographical Pole; second, to ensure the success of a team which was to make for the South Magnetic Pole.

In the event Professor David with two companions, Mawson and MacKay, set off to climb the mountain with Adams, Marshall and Brocklehurst as a support party. After six days of climbing in a temperature of between 20 and 30 degrees below zero, the whole party achieved the greatest feat of Antarctic mountaineering in history, even though for two of those days they were imprisoned in their tents by a howling blizzard. When at last they reached the volcanic bowl at the opening of the active cone they were half choked with wreathing sulphur fumes, and felt the great blocks of pumice and lava beneath their feet shaken by the rumbling of the volcanic action below.

A column of steam rose up from the crater itself, reaching to thousands of feet in the frozen sky. As it moved in the vagaries of the wind, Mawson was able to get a clear view, which showed that the abyss was in the region of 1,000 feet deep and reaching to half a mile wide. Everywhere around the great upper bowl steam was curling from fissures, while towers of lava, taking macabre shapes, rose out of the hard-frozen snow-plains around.

Having made scientific observations and readings, the team set off on the return journey. In contrast to the homeric toil of their upward climb, they got down again in less than one day, using the frozen slopes as enormous slides and allowing their heavier equipment to whisk down ahead of them.

This achievement before the long, sunless winter set in gave a tremendous fillip to the morale of the whole party. Five months later, on October 5th, the Magnetic Pole team set forth, marching along the east coast of McMurdo Sound and then climbing the glaciers to the great ice plateau.

At first Professor David led but, after he was attacked by snow-blindness, Mawson took over command. They had to make two attempts before they could climb the glacier on to the plateau, and from then on it was grim going on shortened rations until January 18th, when their dip-needle showed that they had reached their goal.

By carefully checking observations they plotted the South Magnetic Pole at 72 degrees 25 minutes south latitude and 155 degrees 16 minutes east longitude at a height of 7,260 feet. There they set up a staff and raised the Union Jack, but apart from that tiny fluttering colour, and the evidence of their scientific instruments, there was nothing to distinguish that special spot from any other in the vast white wilderness of frozen snow which stretched around as far as the eye could see.

While this second achievement of the expedition was in the making Shackleton himself set off to try to fulfil the great dream of his own personal life. On November 3rd he, Adams, Marshall and Frank Wild set off for the South Geographical Pole with four ponies pulling four sledges carrying supplies to last ninety days. They faced a journey out and home of 1,500 nautical miles.

This, Shackleton knew, he must cover within the short four months of the summer season—for the winter blizzards would spell certain death. To succeed, he and his party had to make daily marches three times as long as Scott's previous average.

Naturally enough, they had prepared the way by going out to leave depots, but to a great extent they were relying on the ponies for food as well as tractive power.

In the early part of the march they made excellent time. On the tenth day they were out of the crevasse region, and a week later they shot their first pony, eating part of the meat but carrying the rest a further 100 miles south before storing it in a depot. They passed Scott's furthest south position on November 26th and pushed on steadily, shooting two more ponies and storing the meat in depots before they reached the great glacier leading to the Polar plateau. This Shackleton named the Beardmore, after a great friend and financial backer.

Before they had climbed on to the plateau the last pony was lost in a crevasse—and Wild, to whose sledge it was harnessed, narrowly escaped death at the same time. From that point onward the party had to man-haul their own supplies.

On the high snows—they were soon marching at an altitude of 9,000 feet—all began suffering from the thinned oxygen content of the air, and their reduced meat supply represented by the lost pony forced them to cut rations to a state of semi-starvation. The lack of oxygen induced giddiness, slowed their reactions and brought nagging headaches. In this weakened condition they felt the biting, penetrating cold severely.

After Christmas, when they reached to within 250 miles of the Pole, Shackleton was secretly worried. By the turn of the year he feared that, without the miracle of a sudden temperature-rise and a strong wind at their backs, they were doomed to failure. Certainly they could push on and reach the Pole, but they would never get back alive. There was just not enough left to eat to make the return journey possible, quite apart from the fact that time was running out and the period of really bad weather loomed nearer and nearer.

Shackleton confided these facts to his log, but outwardly he seemed as cheerful as ever. Already he and his men had penetrated much further south than any of their predecessors. Typically, he decided to march on to the very limits of safety before acknowledging himself beaten.

On January 6th, when they were only just over 100 miles from the Pole, a 90-mile-an-hour blizzard broke, and for the next two days the party were cooped up in their tents. Although half frozen to death and on the verge of starvation, they re-started when the blizzard had blown itself out, and toiled southward for another five hours.

Knowing they were at the limit of safety, if not beyond it, Shackleton called a halt. They planted their Union Jack, just 97 miles short of the South Pole, in 88 degrees 23 minutes south latitude, 162 degrees east longitude. In his log Shackleton entered the bleak statement, "We have shot our bolt . . . we have done our best."

With a last look at the flag fluttering in the grim white wilderness, he turned and started the long trail back.

On an average daily ration of a pot of hoosh (stew), a cup of tea and a biscuit or so, the ravenous little party retraced their steps. All knew that their lives depended on luck—luck with the weather. Mercifully, this was in their favour, so that they reached their food depot at the top of the Beardmore Glacier in twelve days.

The descent of the glacier brought them almost to the end of their endurance, for there the luck turned malignant again. After a meal of the pony-meat in the lower glacier depot all of the party were stricken with dysentery.

By some miracle of fortitude, however, they managed to get going again and slogged steadily onward. On February 19th they saw the smoke of Mount Erebus, and knew that they were within striking distance of home. By the time they reached their last food depot, however, Marshall was in such a state of near collapse that Shackleton and Wild left him there with Adams, and marched on to reach the base and get help from the *Nimrod*.

When they reached the base they found it deserted and the ship nowhere to be seen. Shackleton guessed that ice conditions had caused the ship to move. As he half-heartedly tried to make contact by the wireless set, he knew that the end was perilously near. Both he and Wild were exhausted, and winter was close.

To their delight, however, they made contact with the ship immediately. It was not too far away, and soon it appeared steaming to their rescue. Shackleton insisted on personally leading the party which at once went back across the ice to fetch Marshall and Adams.

Long before that time the triumphant Magnetic Pole Party had returned and been taken aboard, so that when Marshall and Adams had been picked up from the depot the whole expedition was complete.

On March 1st, with all safe aboard the *Nimrod*, Shackleton sailed for home. He had the record of not having lost a single life in an expedition which had reached the South Magnetic Pole, scaled Mount Erebus and penetrated further south than men had gone before.

It was typical of Scott's generosity of character that he should have been among the first to meet Shackleton and congratulate him on his arrival in England.

Shackleton was knighted in the July of that year, loaded with honours, and acclaimed from one end of the world to the other. In the years 1909 to 1913 even his closest friends thought that the born wanderer was settling down at last. Indeed in those years it seemed that all the prizes for which he hungered had been won by other men.

Roald Amundsen reached the South Pole in 1911, a month before the ill-fated Scott. The American Admiral Peary conquered the North Pole. Shackleton's own ex-comrade, Douglas Mawson, made five brilliantly organised surveys of Wilkes Land and spent two winters in the ice. By the end of 1912 a Japanese expedition had made an exploration of the Ross Ice shelf and the King Edward VII peninsula, while a German expedition under Dr. Filchner had penetrated deep into the Weddell Sea and drifted for nine months locked in the ice.

These facts gave rise to the remark that was made on the occasion when I first met Shackleton in the winter of 1913—the question as to why he did not rest upon well-earned laurels. But it was typical of Shackleton's life—and a factor in the cause of his death—that he could not relax. Indeed, ever since he had returned from the 1908 venture his mind had been secretly busy planning a greater expedition than any that had yet been attempted.

This he had just announced, with a request for finances, at the time of the meeting of which I have spoken. He had already given it a resounding title—"The Imperial Trans-Antarctic Expedition"—and it meant no less than the title implied.

Shackleton planned fundamentally the same venture as that undertaken by Dr. Fuchs and Sir Edmund Hillary. He proposed to cross the entire continent of Antarctica, starting from the area of the Weddell Sea at the point reached by the German Dr. Filchner in 1911, and marching clear across the South Pole to McMurdo Sound.

To make this possible he planned for a second party to march from Hut Point and lay depots to the top of the Beardmore Glacier so that they could meet him after he had passed the Pole—just as Hillary planned to meet Fuchs and his party.

CHAPTER II

The plan caught the imagination of Englishmen, and by the very fact of suggesting it, Shackleton once again became the most famous man in the United Kingdom. The Government contributed £10,000 to the expedition; the Royal Geographical Society £1,000. Contributions poured in from individuals, from institutions, from the nursing-staffs of hospitals, from most of the great English Public Schools. The biggest contribution of all came from a wealthy Scott, James Caird, who wrote Shackleton a princely cheque for £24,000.

I was one of the legion of schoolboys who put up a mite of pocket money for what we felt was the most tremendous adventure any man had yet attempted. I mention this only because that one meeting with Shackleton altered the course of my life, and enables me to tell the story of the expedition from a first-hand source. The explanation can be covered in short space.

At that age I was very conscious that my father had sailed across the world before me, and that my great-grandfather had been a whaling captain in the South Seas. Indeed, the earliest household ornaments I remember (still treasured possessions) were a pair of whales' teeth very beautifully skrymed with pictures of far-away ports, and a magnificent workbox in whale-ivory and teak-wood which the old Captain had made for great-grandma during his long voyages.

The old man's portrait in his blue coat and high stock hung in the dining-room; he had a round face and a prodding nose, and was altogether not unlike myself. I was always pleased that he hadn't got a big, jutting chin because, although I admired that feature enormously in Shackleton, I hadn't got one myself—and my normal-chinned great-grandfather had been enterprising enough to die painfully, if romantically, of scurvy while in the Fiji Islands. In short, I felt that there was hope for me yet . . .

In 1918, with hundreds of others, I was taught to fly in the then new Royal Air Force, but before I had completed training the war ended. So I was left, a rather over-romantic youth, with no tales to tell of combat in the high skies.

Still, like any other romantic, I had an idiotic desire to shine and to be out of the ordinary. Shackleton had poked his big chin all round the seven seas before finding fame and fortune. Great-grandfather, with no chin to speak of, had done the same thing—

although of his modest fortune there was not enough left to see me through University.

I therefore went to sea. I went in the fo'c'sle, since I did not want to hang about and wait for an apprenticeship. While at sea I had the great good luck to find myself shipmates with one "Chips" McNish, who had been Shackleton's carpenter on the Imperial Trans-Antarctic Expedition.

Chips was neither sweet-tempered nor tolerant and his Scots voice could rasp like frayed wire cable. He had no use whatever for a gangling first-tripper who spoke, as he expressed it, "like a pimp at a whore's tea-party". He pronounced it "pump"—but my obvious amusement cost me dear.

I loved him not. The ship was old and ill-found. The weather was as foul and bitter as it can be in February in the North Atlantic. The work, to my untaught muscles, was fiercely harsh.

Yet in the course of the next few weeks I discovered Chips to be one of the most courageous and skilful men I have ever met. My enthusiastic loathing of him gave way to respect. Finally, after two notable incidents, we actually became friends, and I found in place of a tormentor a good shipmate with a shrewd wit and a power of describing men and high adventure that was admirable.

The two incidents I will recall briefly because they show his quality—and also give a measure of the men who survive Polar exploration.

The ship on which we served was sailing "light" with the Plimsoll mark several feet above the water-line. In the 'tween-decks, however, she carried a cargo of 6-foot-long cast-iron pipes.

With such a stowage it will be obvious to any sailor that she rolled like a pig in any kind of weather. We struck the worst. As a result the cargo of pipes broke loose, and they were soon tumbling and thundering across the darkness of the upper hold from one side of the hull to the other.

In order to prevent the uproarious mass of iron from smashing clean through the side-plates, the Captain brought the ship head-on to the seas and held her there as best he could. But the rolling was still wild, and no men could have gone into the hold to try to secure and lash down the pipes without being battered to death in the first minute.

Chips McNish appeared among the crew, bawling orders for us to pick up bags filled with fine coal which were being sent up the ash-lifts from the stokehold.

As each man shouldered a coal-bag Chips served him with a storm-lantern. Then, with a coal-bag on his own back and a lantern hanging over the crook of an elbow, Chips led the way below.

He waited for the depth of a roll when the mass of loose pipes had momentarily finished moving and were heaped against the side. Then he ran, slipping and staggering into the gloom, dropped his coal-bag, and turned to run back.

The ship heaved herself up and began the plunging roll to the other side. The pipes began to slide—to avalanche.

But, as the mass approached him, Chips grabbed upwards, caught an overhead steel beam, and hung there with his legs up while the pipes clanged and thundered across, a few inches beneath his broad bottom. When the roll was again deep he let go and ran out to us, grinning cheerfully.

"There ye are, lads," he said. "Get plenty o' bags in among that lot and they'll soon slow it up, an' then we'll be able to jamb 'em solid. Come on now—there's plenty o' beams to hang on to and keep ye're bums safe. . . ."

That was when I first began to respect him. The low hold was not a pleasant place; the uproar of banging and smashing iron was daunting; it was pitch dark, except for the bobbing and swinging points of the storm-lanterns. I felt that the man who had gone in there first was a man indeed.

As a matter of fact the idea failed because while work was in progress the ship's engines failed, too, by reason of trouble with the condenser. Naturally, she fell away and began drifting helplessly broadside to the gale.

Privately, I gave up hope. Not so Mr. McNish. Soon his voice was rasping again and, with a shivering crew on the foredeck, he was about the business of making a sea-anchor out of one of the winch-booms, a big bight of canvas and sundry lengths of chain.

Although only an amateur yachtsman, I could see the idea was good, even with its object of holding a 5,000-ton ship's head to sea. When dawn came it was ready to be hoisted outboard—whereupon the winch lifting it jambed-up solid, and the big boom with all its gear swung from side to side of the deck, knocking men over like ninepins. By the time I had dived for cover, Chips was already leading a toiling party to clear the winch.

He never seemed to feel surprise. He never stood just watching something happen. He was always doing something about it while it was still happening. He could work seemingly endless hours, and if he ever knew fear, not a suspicion of it showed on the solid, graven brickwork of his face.

We got out of trouble and survived because, although the sea-anchor was never launched, the weather chose that day to calm down. Help from another ship patched up our condenser and we finally limped into Newport News, U.S.A., twenty-nine days out from Albert Dock, London—my worst and longest Atlantic crossing: as it was, I think, for every man on board. When I went ashore I saw Chips stretched out on his bunk peacefully reading a coloured magazine with an indelicate cover. The ship was quite good enough for him. America, at that time, was dry. . . .

I promised two incidents about him. The second shall be shorter still. Long after we had become good friends we were loading meat from lighters in Tokamaru Bay on the north-east coast of New Zealand. One evening the weather blew up foul, so our Captain decided to up-anchor and ride it out in the open sea, rather than stay dangerously close to a lee shore.

So far, so good; but while we were about the long business of hauling the anchor up, the bridge company and the look-outs on duty were blinded by driving waves of sleet and thin snow. They lost all sight of the shore lights, and those of another vessel—the *Admiral Codrington*—which had also been loading at a point about a mile from our position.

Suddenly, out of the darkness and murk, the *Codrington*'s bows loomed up and crashed into our side. I don't know who was at fault—one of the other of us must have dragged anchor in the gale, so that a blind collision resulted. Anyway, there wasn't time to think much about it then.

Chips McNish didn't waste any time at all. His bulky figure in flapping oilskins was toiling on the forepeak as soon as the Captain was bellowing, "Let the anchor go", from the bridge.

The anchor and most of its chain was cleared and dropped away. This, at least, allowed our engines to get us out to whatever safety the open sea offered.

There Chips drove us to open up the hatch nearest to the point of impact. Then he disappeared, and came back shouldering an electric light cluster with a trailing cable.

As he swung a foot over the hatch-coaming he grinned at me. "Better come down an' get wet," he grunted; "or ye'll be gettin' a hell of a lot wetter."

As his bent head disappeared down into the dark pit I heard the sound of a cataract of water coming in through the side. I have never had less desire to go down an iron ladder than at that moment.

But directly he got his light-cluster switched on, Chip's figure was as active as a giant black-beetle. He slithered and plunged over a cargo of tallow barrels and calmly inspected a tall, jagged slit in the side through which water was cascading into the ship.

Repair was out of the question—we were at sea in a freshening gale. The only thing to do was to haul the cargo barrels up on deck and then roll them along so that they would alter the fore-and-aft trim: the idea being to get our puncture—or most of it—above the water-line.

Well, we did it while our engines drove us at full speed for Auckland and the Calliope dry dock. The trip took the best part of two days. During that time we tried to keep the rising water in check with the steam-pumps. But the rose-boxes (the filters in the bilges) clogged up solid. I saw Chips and the first and second mates, stripped to the waist, going head first down into the stinking swill to try to clear the boxes with their bare hands, while men lay holding their legs.

From then on all hands had to turn-to and swing on hand-pumps as fast as they could be rigged. It was monotonous, rhythmic work and I, personally, was pretty dead tired when I started.

I must have fallen over, asleep, for I suddenly realised that Chips, his face running water, was gripping my arm and pulling me back to the pump-handle. He clamped a ham-like hand on it beside my own and began pulling and pushing in unison.

"That's reet," he breathed cheerfully. "Keep goin'. We'll mak' a sailor o' yu', yet!"

Well, that was Mr. Chips McNish. In easier times on shipboard—in the long "make-and-mend" lazes under the hot sun of the tropics—he told me of his journey south as carpenter with Shackleton's Imperial Trans-Antarctic Expedition.

The things that happened on that venture make the incidents that Chips and I experienced together the smallest of small beer by comparison. Yet now, recalling the story he told me, I should like to make it clear that afterwards I checked every fact with the official records—because sailors are fond of embroidering any good yarn.

I am glad to report that the comparison showed Chips hadn't embroidered at all—except in some tiny, entirely personal matters which shall be noted.

I am, however, going to make one difference to his original version. Broad Scots is pleasant enough to hear, but personally I detest having to read it in the patched and broken spelling by which it is usually expressed.

The story will therefore be told in plain English.

CHAPTER III

For his two-party expedition Shackleton bought two ships. One was the 350-ton Norwegian *Polaris*, which he re-christened *Endurance* and adopted for his own team which was to land on the Antarctic Continent as far south as he could get in the Weddell Sea. The other, the *Aurora*, he took over from Douglas Mawson, who had used it on his expedition to Wilkes Land.

The *Aurora* party joined their vessel in Tasmania, where she was lying, and made their preparations to sail for the Ross Sea. Meanwhile, just when Shackleton had everything prepared to sail in the *Endurance* from Plymouth, general mobilisation of the British Forces for the war of 1914 was declared.

At once he notified the Admiralty that the men, the ships and the stores of his entire expedition were at their disposal for immediate active service. Next day, August 4th, war was declared. Yet the First Lord of the Admiralty, Mr. Winston Churchill, found time to send Shackleton a telegram in which he expressed thanks, but ordered the expedition to continue according to plan.

Therefore the *Endurance* sailed from Plymouth on August 8th for the lonely southern wastes whilst fighting started in the north. Second-in-Command was Shackleton's old and trusted comrade, Frank Wild. Frank Worsley, an expert navigator, was captain of the ship. There was a strong scientific party, and amongst the deck officers were two veterans of Scott's expedition, Crean and Cheetham.

Crean, incidentally, had been decorated with Petty Officer Lashly for their wonderful effort in saving the life of Lieutenant E. R. G. R. Evans, and later had been first to find the silent tent in the wilderness wherein lay the dead bodies of Scott and his two remaining comrades.

One extra hand joined the expedition when the *Endurance* called in at Buenos Aires, although his presence was not discovered until the ship had left port. He was a lad named Blackborrow, who stowed away on board after having made repeated but unsuccessful efforts to join the expedition officially. Outwardly, Shackleton was at his most ferocious when the youngster was hauled up in front of him, but inwardly he was amused at his tenacity and courage. In the outcome the boy was officially entered on the ship's books as steward. He made an exemplary showing throughout the expedition, although towards the end he was rendered helpless with frost-bitten feet.

Three months after leaving Plymouth the *Endurance* put in at Grytviken, the capital of South Georgia, which in those days was not much more than a heap of rotting whale-carcases surrounding a whale oil factory. Now, with modern improvements in processing, almost nothing of the great fish goes to waste. Then, in the words of Chips McNish, "Ye could snuff the aroma if ye were five miles out to wind'ard". But he added that none of the crew realised, when they thankfully put to sea again, what prayers of thankfulness would be in their minds when next they were destined to detect that special fragrance.

None of them took especial note of the general features of that remote island, with its ice-capped mountains rising up in the centre, its white glaciers running down to the sea-edges, its lower meadows, which even in summer grow no more than sparse patches of tussock grass. Yet the central mountains, wreathed in their almost perpetual fog, were destined to be a barrier between life and death for the whole expedition—a barrier over which only Shackleton's fortitude and driving leadership were to triumph.

The *Endurance* steamed directly into the Weddell Sea, keeping as close as possible to the eastern shore until she was surrounded by pack-ice. Shackleton found open water beyond 70 degrees south and named the coast he there followed after his financial good angel, Mr. James Caird.

In late January, when he had penetrated as far as 76 degrees 34 minutes south, the slow way of the ship was at last stopped altogether. The ice froze solidly all around, and Shackleton realised that he had no other course but to stay where he was throughout the winter until spring brought the thaw.

On this part of the expedition Chips waxed eloquent. In his broad Scots voice he described mirages which form brilliantly in the Antarctic sky—weird and magnificent towers and domes, coloured white and gold, like pictures out of a child's story-book. At the time I frankly disbelieved him—although to a certain extent I was willing to accept his description of ghostly icebergs that could be seen upside down on the horizon. I knew enough of optic and atmospheric phenomena to believe that sort of thing possible. But the true mirage, with its pictures of fantastic-coloured buildings, I believed to be a peculiarity of tropical desert lands.

Chips, however, was not romancing. In later years, when I checked his story with the written records of others, I found the "Arabian Nights" mirages of Antarctica fully attested. I also found in Dr. L. D. A. Hussey's *South with Shackleton** the only incident in which my shipmate did not perhaps stick completely to the truth. Dr. Hussey was the expedition's meteorologist, but he had another attainment which brought enormous pleasure to all his comrades—he was a first-class performer on the banjo. Incidentally, the shrewd Shackleton rated this gift as "excellent mental medicine", and would not allow Hussey to abandon his instrument even at a time when the party had to jettison every ounce of material that could be done without.

Hussey's banjo was not only in demand for sing-songs and impromptu concerts; to everyone's amusement, it was found to attract penguins. Whenever he sat on deck and played, an audience of them would come waddling across the ice to stand listening intently.

"Ay, they're queer creatures, an' ah'd never have been surprised tae see them clappin' their flippers when the doctor finished a tune," Chippy told me. "When he played guid old Scots tunes, that was. They're sensible birds; they liked real music. But, ah can tell ye that if he played anything else they'd break away an' rush off in a panic."

I was amused years later to see in Dr. Hussey's own book—in which he also mentions the Oriental mirages—the same story, but

* Published by Sampson Low.

told exactly the other way round. The doctor writes: "They (the penguins) liked negro spirituals and Irish jigs. A strong favourite of which they never tired was 'It's a long, long way to Tipperary'. But when I turned to playing Scottish music—well, they just fled in horror, making off as fast as their short legs would carry them."

Who am I to say which account was right? This weighty question I must leave to posterity.

Although the ship was held fast, there was plenty of work to keep all hands occupied. The dogs had to be put over the side and exercised constantly in the sledges to keep them healthy and in good form. Boreholes had to be made regularly for the taking of soundings and water temperatures beneath the ice.

There were also the regular recordings of wind current and direction, and the re-checking of navigational observations.

Shackleton had realised that the ice-mass in which the ship was frozen was moving—drifting steadily northwards. During the first three months the drift carried the *Endurance* 60 clear miles—unfortunately, in precisely the opposite direction to that which was desired. May brought the beginning of the long Antarctic winter, during which the sun was never seen at all. There was total darkness, except during the bright phases of the moon at night, when the party played hockey and organised sledge races across the ice—always to an appreciative audience of penguins.

So the winter dragged on, but with the return of the sun and the start of the spring thaw Shackleton realised that the ship and everyone in it was threatened with destruction. After very heavy blizzards in July, some of which lasted for a clear three days, the surrounding ice-pack made a very different picture from what it had been during the winter months. Great cracks had appeared, in which open water could be seen. All round the ship there were signs of growing pressure. Masses of ice were rising up on top of each other; enormous blocks were being forced out of place. In short, owing to the thaw, the floe in which the ship was imprisoned was being crushed by other, vastly greater, masses of ice, of which it formed the centre.

As the floe cracked, split and collapsed, the ice pressed against the sides of the *Endurance*. It was as though she were caught in the jaws of a nut-cracker operated by an invisible hand with a pressure-strength of thousands of tons. The stout little ship withstood it magnificently, and the party in general felt that with any luck she would weather the ordeal. But Shackleton knew the grim truth, although outwardly he preserved his normal cheerful manner. He told Wild and Worsley in strict confidence of his fears, and an emergency routine was at once put in action. Stores were brought up from the hold, boats were cleared, everything was made ready to abandon ship at the shortest possible notice.

Then the pressure began to take its full toll. In the months between August and October the little *Endurance* was gripped, compressed and twisted by the grinding of the ice-masses in which she was imprisoned.

Meanwhile, the ship's boats—everything of use that could possibly be moved—were dropped over the side on to the ice itself. Now the whole party realised that their only hope of survival lay in a long, grim sledge journey over the humped and crevassed surface of the pack. On the 27th of the month the *Endurance* was finally destroyed. Her heavy transverse beams were bent up by the enormous pressure and, one after another, cracked with the sound of gunfire. Her decks, of course, were broken outwards in matchwood, while the sides of the little vessel buckled in. Finally she began settling, a shattered, hopeless wreck.

As Shackleton and his men stood a hundred yards or so away on the ice watching her death-throes in the gloom of an Antarctic evening, the leader turned to Dr. Hussey.

"I brought your banjo ashore," he said. "I found it in the wardroom. Look after it. We shall need it."

The party which watched the tragedy numbered twenty-eight men, who had with them forty-nine dogs. By this time they had spent 281 days in the frozen ice-pack and, by Shackleton's calculations, the mass had drifted a distance of over 1,000 miles.

The nearest place where he knew he could renew his food supplies was well over 350 miles away, at Paulet Island. His first problem was how to get the ship's boats across the packed and tumbled pressure ice to the edge of the open water beyond which the island lay.

What followed forms one of the most astounding stories of human endurance in the whole history of exploration. On the first night the ice upon which the men made their camp split apart no less than three times—and three times they had to move and re-erect their tents, shift their stores and man-handle the heavy boats to different sites.

Next day Shackleton led a reconnaissance party, which found

Above: Shackleton's party cutting a way for the *Endurance*.

Below: An anxious moment as *Endurance* heels over.

Above: Dr. L. D. A. Hussey, Shackleton's meteorologist, with a dog-team.

Right: Ernest Shackleton (right) with his carpenter, "Chips" McNish.

what seemed to be a safe place on a floe about a square mile in area. As the crushed wreckage of the *Endurance* finally sank out of sight the party once again man-handled all their stores and gear, together with the boats, a full mile and a half to the new pitch. There they lived in comparative safety for the next two months until the constant splitting and cracking of the floe forced them to move yet again.

Now the weakest of the dogs, together with the pups which had been born, had to be killed, since in such desperate circumstances there would be no hope of their survival. The ship's cat had to go the same way, although this nearly broke McNish's heart. She had been such a special pet that she was known as Mrs. Chippy to the whole expedition.

The grim task cast a gloom over the whole company. The weather conditions in the first days of the camp could scarcely have been worse. Winds were high, and blinding snowstorms whirled around their flimsy tents at a temperature well below zero.

By day parties went out to hunt seals and penguins, their only means of keeping themselves and the remaining dogs alive. They had managed to salve a supply of flour, but had no yeast, so that it was impossible to make bread. The monotonous diet of seal or penguin meat was only accompanied by flour scones without leavening. What biscuits they had Shackleton ordered to be put aside for their final journey by the boats—if and when they could ever be man-handled to the edge of the open water.

While the hunting parties were about their business, Chips McNish was busy building sledges upon which the three boats could more easily be hauled across the ice. These he made from wood and material he and others had collected from the wreck of the *Endurance* before she finally sank beneath the grinding ice-floes.

The sledges were completed and the boats loaded on to them on December 23rd. It was then found, however, that the combined man-power of the expedition was not sufficient to move all three. The weight of each boat with sledge amounted to over a ton and was as much as the expedition could move at a time over the broken surface. One, therefore, had to be abandoned, and only the *James Caird* and the *Dudley Docker* were taken on the journey.

They could only be moved singly. Having hauled one for a mile, the men had to trudge back for the other and haul it the same distance. Every mile of progress therefore meant 3 miles of foot-work and hauling. In the space of one week the expedition advanced only just 10 miles.

By the end of December, Shackleton realised that the plan was hopeless. The appalling work on grimly short rations was bringing everyone to a state of dangerous physical weakness.

He decided to make camp again. The ice upon which they were toiling was steadily drifting northwards, and all he could hope for now was that the drift, and the eventual breaking up of the ice itself, would bring them to open water. There was sufficient flour left to last ten weeks, and the carefully-hoarded rations kept back for the boat journey might be eked out to last the party for three months. Their only hope of existence still lay in hunting. Meanwhile, in order to reduce the number of mouths which had to be fed, Shackleton was forced to have most of the remaining dogs killed.

At this second base—aptly named Patience Camp—the expedition was marooned for a further three and a half months.

Apart from the occupation of hunting it was a period of deadly monotony, lightened only by evening sing-songs led by Hussey's invaluable banjo. Shackleton sent a party to get the abandoned boat, the *Stancomb Wills*, and haul it in. As the weeks dragged on, rations had to be reduced to only fourteen ounces a day for each man. The last of the dogs had to be killed and turned into food. The weather worsened steadily and alternated between freezing, penetrating dampness and raging blizzards.

Meanwhile, observation showed that the northward drift was gradually increasing in pace. By the middle of March the floe had actually drifted to the latitude of Paulet Island, but it lay many miles eastward beyond the tortuous mass of broken ice, and was beyond reach. The drifting floe was steadily decreasing in size. Parts of the edges were calving and breaking away. From time to time it was crashed into by huge icebergs and reduced still further.

By the first week in April the floe had been reduced to a triangular shape measuring only about 100 yards each side. Ice-masses were still all around, but the open sea was ahead. Shackleton had decided to launch the boats on the morning of April 9th—when the floe split clear apart beneath them.

Fortunately there were no casualties. The three boats were got into the water, stores and men piled into them and the oars were shipped. The sea was rough, the castaways soon wet and frozen, and most of them seasick.

But their hearts were high and they grinned at each other and joked as they pulled. After six months of deadly monotony on the ice, with their ship sunk and with no one in the world knowing where they might be, they felt that they were at last on their journey home. Shackleton laid course for Elephant Island, which he reckoned to lie about 60 miles to the north-west. He knew, however, although he said nothing to the others, that their chances were still slim.

Only if wind and water were favourable could they reach their goal. If they missed it their journey's end would lie somewhere in the vast, storm-tossed solitude of the Antarctic Sea.

For the next five days the expedition existed in a conscious nightmare. Chips McNish told me that Shackleton did not sleep throughout that time, and this is borne out by Dr. Hussey in his *South with Shackleton.* What sleep the rest of the party could get was only snatched and was constantly broken by sudden emergencies. Throughout the whole time the temperature was below zero and the rough sea was lashed by blizzards.

Everyone was tortured with thirst. Owing to the impossibility of getting ice melted for drinking-water, they could only suck ice-chips which brought up blisters on lips and tongues.

They had practically no protection from the seas which broke inboard and left a surface of ice over everything. All were suffering with frostbite in varying degrees and most were seasick.

For the first few nights before getting clear of the ice-pack they camped on floes, hauling the boats up out of the water and then pitching tents. On the first night the floe split in half directly under the tent of one of the ratings who fell in his sleeping-bag straight down into the water.

Shackleton, on his eternal watch, dashed to the scene, flung himself flat and reached down to grab the man and heave him out bodily. No sooner had he done so than the crack closed again as the halves of the floe, weighing thousands of tons, crashed together.

Finally, however, the boats were clear of the pack and the nights were spent riding to improvised sea-anchors. On April 14th the weather cleared and Elephant Island was in sight, but the sea got up again, and it was not until another appalling night had passed and dawn broke in thick weather conditions that the boats sailed under the sheer, precipitous island cliffs.

A landing was made and the boats drawn up on a narrow beach. As they began making camp the men were thankful to have actual land under their feet instead of the ice which they had endured for six deadly months. They shouted and danced—and in the words of Chips McNish: "Ye'd ha' thought every man o' them was roarin' drunk."

Drink there was, but very much better than any spirit—hot drinks turned out by the cook, who set about getting a fire going directly his feet touched the shore. Then, apart from a watch by turns, the castaways huddled down and slept clear round the clock.

Next day, however, they had to take to the sea again. Shackleton realised that the beach on which they had landed would be nothing less than a death trap if any inshore gale broke, for he observed that wind-driven seas at high tide had been beating against the face of the cliff. This was sheer and perpendicular without foothold for a cat.

Although there were those who grumbled, the leader was proved right, for shortly after the boats had put off again a full gale sprang up and they saw clearly enough what would have been their fate. After another exhausting day at the oars they found a beach which, although it was also backed by inhospitable cliffs, rose high enough to be out of danger from the sea. It was only about an acre in size, a surface of boulders and rock pebbles, but here it was possible to make a reasonably comfortable permanent camp. The boats *Dudley Docker* and *Stancomb Wills* were hauled up to the most sheltered part of the beach and then inverted on roughly built foundations. In this way a solid "house" was formed which gave warmth and protection that was luxurious compared with the flimsy tents.

Now one of the grimmest tasks of the whole expedition had to be carried out. The boy Blackborrow, who had worked as hard and courageously as any of his comrades, had feet so badly frostbitten that his life was clearly in danger.

Shackleton authorised the doctors, McIlroy and Macklin, to use the tiny amount of chloroform they had managed to salve—and Blackborrow's toes were amputated. Fortunately the lad made an excellent recovery from the operation, but the immediate period of his convalescence was to be grim enough.

Even with a reasonable supply of seal and penguin meat, Shackleton knew that no men could hope to live longer than three months or so upon that bleak and freezing beach. Naturally they were more happy and cheerful in spirit now than they had been for six months past, but they were physically weak—and the inevitable Antarctic winter was looming close again.

No one in the world knew where they were. Elephant Island itself is uninhabited and, indeed, they were the first men in history to make a landing at the foot of its towering cliffs. Since, in any case, a landing was thought to be impossible, no rescue ship would be likely to waste time searching its bleak edges. The only hope of survival lay in making yet another voyage in the remaining boat, the *James Caird*, with sufficient crew to sail her to the nearest point of civilisation and get help.

Under Shackleton's orders Chips McNish and Seaman McCarthy prepared the *James Caird* for what was to prove one of the epic voyages of the history of the sea. From parts of sledges and odds and ends of material they built a framework over which canvas could be stretched from her bows to well aft. Then they sewed on a canvas covering, although this was homeric work in itself. The canvas they had amongst their stores was almost solid with ice which they had to thaw out over a fire before it could be stretched. Then, with badly frostbitten hands, they had to work with sail-palm and needles as best they could.

Within a week they had the boat ready, and Shackleton called the whole party together and explained his plan. The nearest point of civilisation lay in the Falkland Islands, something over 500 miles away. The point Shackleton decided to try for, however, was much further off—a distance of more than 800 miles. This was the whaling station at South Georgia which had been their last port of call at the start of the expedition. The reason for his choice was that the boat would have the advantage of the prevailing north-westerly winds—which would be against them if they tried for the nearer Falklands.

The men listened intently and quietly to his explanation. At the end of it he called for six volunteers to go with him on the voyage, which they all knew, without the telling, to be a blind gamble with death. Every man stepped forward.

Shackleton therefore picked his crew by choice. Worsley, the brilliant navigator, was an obvious first nominee. Shackleton then picked Crean, the second officer, Chips McNish, and seamen McCarthy and Vincent.

He made the wise decision that Frank Wild, second-in-command of the expedition, should stay as leader of the rest of the company who were to wait for rescue on the bleak Elephant Island beach. If no rescue ship arrived, Wild's orders were to try to get the party away in the beached boats with the coming of spring, and make for Deception Island, where there was a chance of being picked up by whalers.

The *James Caird* with Shackleton in command was launched on Easter Monday, April 24th, 1916. It was a difficult launching, and Chips McNish and one of the others were both up to their necks in water before they could scramble aboard. This beginning in itself was almost a tragedy, for from then on they had no chance of drying their clothes.

The boat, a 20-foot ordinary ship's whaler, set sail upon her 800 miles voyage across the deepest, stormiest ocean in the world. She had been ballasted with about half a ton of pebbles, made up in bags contrived from blankets, with the addition of about 500 lb. of the roundest boulders that could be found on the beach. From then, for the next sixteen days, the gallant little crew were engaged in a fierce struggle for their lives which brought all of them to such a pitch of frozen exhaustion that only the knowledge that other lives depended upon them kept them from complete collapse.

A very cockleshell in the gigantic seas, the boat shipped water constantly, and baling was regular work for all hands. Chips' canvas cover began to fail under the strain and water came through everywhere. It was almost a relief when the temperature fell and a glistening sheet of ice covered the whole craft—but this caused her, by its weight, to wallow lifelessly and dangerously, so that the crew had the added task of chipping and cracking it away.

Shackleton's own description (from *South*) gives a vivid picture, for all its restraint:

"... Deep seemed the valleys when we lay between the reeling seas. High were the hills when we perched momentarily on the tops of giant combers. Nearly always there were gales. So small was our boat and so great were the seas that often our sail flapped idly in the calm between the crests of two waves. Then we would climb the next slope and catch the full fury of the gale ..."

By night Shackleton had the boat riding to a sea-anchor in order to give the frozen, half-starved crew some respite. But this came to an end when the head-rope, on which the anchor was trailed, parted owing to the constant abrasion of ice which had formed over the bows. At last, on the twelfth day of the voyage after a full gale, the weather cleared and Worsley was able to make observations which showed they had reached to within about 100 miles of their goal. Yet even with this good news Shackleton wondered if they could actually make it.

The crew was tortured with thirst, since the fresh-water supply was not only low but contaminated with sea-water—and reduced to a daily half-pint per man. They were all moving and working in a condition of slow stupor, and even when South Georgia itself was sighted on the fifteenth day, they hardly seemed to realize that the end of their dreadful ordeal was near.

Even so, another full day had to pass before Shackleton found a cove in which it was possible to make a safe landing. He ran the boat on to a shelving beach and the exhausted crew tumbled stiffly over the side to haul her up on the swell.

At this actual moment of salvation, with the hard earth once again under their feet, life seemed to flow back into their veins. All were grinning, and some croaked in laughter; but then there was a sudden yell for silence.

The quiet that followed was broken by the most beautiful sound any of them had ever heard in their lives. It was the sound of running water from shoreward—running water—which meant fresh water.

A few moments later all six of them had flung themselves down where a spring ran down to the beach, and were gulping the ice-cold liquid.

Since the party were too far gone in weakness to beach the heavy boat, it was left moored and they found shelter in a cave for their first night ashore. Here also they managed to prepare a welcome hot meal of young birds they had found in the nests of albatrosses. In Shackleton's own words, "The flesh was white and succulent and the bones not fully formed almost melted in our mouths."

As he lay down to sleep that night, however, he knew that his own task was not finished and that there was yet a heavy test for him to face with those of the crew who were physically strong enough to meet it.

Their last-gasp landing had been made on the first area of South Georgia that they sighted. Shackleton knew that this was the uninhabited area. He also knew that the exhausted crew could never stand yet another sea trip round the gale-lashed coast of the island to the whaling-station at Husvik Harbour. The only way to reach it was across the island itself, but that way was barred by a jagged range of mountains and glaciers over 4,000 feet high.

Before dropping off into exhausted sleep Shackleton had accepted the challenge for himself. In the outcome, only Worsley and Crean still had enough strength to make the attempt with him. McNish, McCarthy and Vincent were too far spent to have a chance of success, yet the ingenious Chips was ready with practical help as usual—and fitted screws through the soles of Shackleton's boots to give him a good foothold in climbing.

After a few days' rest and a move of camp to the head of the bay in which they had landed, Shackleton, Worsley and Crean set out to cross the mountains. They were all still too weak to attempt the climb with anything like heavy loads. Therefore they went without sleeping-bags and with only enough provisions to keep them going for three days. Apart from this, their only mountain-climbing implement was an adze, together with a length of rope to which they bound themselves so that they should not be parted either by a fall or by the heavy mists which obscured the heights.

At the start, the weather was fine, and in the first two hours they had reached a height of well over 2,000 feet from camp. By that time dawn was breaking but with it a thick fog settled down from the heights above. This had tragic consequences, for Shackleton missed the course he had laid from the only rough chart that was available. When the fog lifted, the party were faced with the necessity of turning back and making a great part of the climb again.

Twice more during that epic journey they had to turn back from heights gained, climb down, and take a different course up further icy precipices. But even in the face of these heart-breaking disappointments they kept stolidly on, gradually making their way further and further through the mountain range, climbing, slithering and toiling clear through the night.

At five o'clock in the morning Shackleton realised that his companions were nearly at the end of their tether. He was faced with the problem that if, with his own iron-hard fortitude, he urged them on they might collapse or, through weakness, injure themselves in a fall. Yet he knew equally well that, if he once let them give up, the chances were that they would not find the will-power to go further.

At this moment he showed the ingenuity of mind which made him such a brilliant leader. He called a halt, and told Worsley and

Crean that they had done so well that they could afford to take half an hour's rest. Without hesitation the two men dropped down in their tracks and were dead asleep in a matter of seconds.

Shackleton sat beside them, easing his aching muscles, but staying broad awake. He allowed them just five minutes, and then woke then, announcing that the half-hour was over.

Well did he know from personal experience that, even after four hours in a bunk, any shipboard watch-keeper will swear that he has hardly "dropped off" when he is shaken up to go on duty. Worsley and Crean dragged themselves to their feet, not dreaming until many days later of the trick that had been played upon them. They thought they had had their half-hour. They were stoically brave men, and their minds were tuned to the idea that half an hour's rest would give them just enough strength to take up the struggle again.

In short, for the price of five minutes the brilliant Shackleton got out of them all the will-power and determination that half an hour could have given them. As he said afterwards, it was the only thing to do. If he had gone to sleep himself they would all have been frozen to death—and sitting down beside them he could not trust himself to keep awake for much more than five minutes.

By 6 a.m. they had staggered through a pass in the heights and saw below them in the dawn light the harbour and the whaling factory. It was the supreme moment of their achievement. All weariness seemed to leave them. Laughing and cracking jokes, they began the climb down to the world of men. Before they reached the harbour they heard the seven o'clock factory whistle echoing through the frozen valley—an ordinary, homely sound that brought vividly to their minds the further survival they had won by such superhuman effort. More—it assured them that they had achieved something far more important than their own survival. That whistle told them that the rescue of their comrades on the other side of the mountain—and of those still on the beach of far-away Elephant Island—would soon be an accomplished fact.

Mr. Forlee, manager of the Husvik factory, was somewhat startled when he opened his front door in answer to a knock and found himself facing three bearded, ragged men who lurched against each other drunkenly.

"I am afraid you don't know me," said the leader.

Forlee immediately noted the cultured tones of his voice and restrained himself.

"I—I don't think I do," he answered.

"My name is Shackleton," said the leader, and with a gasp Forlee flung the door wide and grabbed his hand.

Since nothing had been heard of the *Endurance* for so long, the world in general had feared the worst for the expedition. Forlee invited the starving trio to enter forthwith, but Shackleton still hesitated.

"I'm sorry," he said, "but—er—we must smell rather."

"Don't bother about that—we're used to it on a whaling station," said Forlee heartily. And in a matter of minutes he had them sitting down in his parlour, and in answer to his shouted orders one of the biggest meals they had ever seen began to appear on the table.

Next morning, after a luxurious night in real beds and after wallowing in real hot baths, the three presented a vastly different appearance in borrowed clothes and with chins smoothly shaven. Shackleton immediately arranged for Worsley to go on a whaling-vessel round the island to pick up the other three of the crew—none of whom recognised him on his arrival until he actually spoke. They were taken on board together with the boat *James Caird* (which, incidentally, was afterwards brought home to England and presented to Shackleton's old school, Dulwich College).

Meanwhile, he had chartered a vessel, the *Southern Sky*, and was having her coaled and provisioned to go to the rescue of the castaways marooned on Elephant Island.

A mass of pack-ice, however, prevented the ship from getting nearer than 50 miles. After repeated attempts to push through, coal shortage forced Shackleton to return. He obtained the free loan of another vessel from the Government of Uruguay, and tried again, but was beaten in exactly the same way—although he reached to within 38 miles of the island.

By now it was the middle of the Antarctic winter, and there were many who believed that Elephant Island would be solidly locked in ice. Shackleton did not believe this. He was certain that the winter ice would be no more than normal pack, constantly moving, so that if he only had the right vessel and a sufficient fuel supply he could wait his chance to con her through to the beach where the castaways were marooned. Moreover, he knew that by now they must be reaching the end of their resources (as indeed they were), and he would far have preferred death to abandoning the rescue attempt.

The Chilean Government now offered him the free loan of the stout little steamer *Yelcho*, together with a schooner which was to be towed to the edge of the pack-ice where her fuel supply would be available for the arduous business of conning a way through.

However, even this attempt was doomed to failure for the tow-rope parted prematurely in a heavy storm and the schooner's engines constantly broke down. For the third time Shackleton returned but immediately asked for, and was given, the loan of the *Yelcho* again.

On this trip his stubborn determination was at last rewarded. Upon reaching the ice-pack around Elephant Island Shackleton was proved right. Although it was now the depth of winter the pack was moving and opening. The *Yelcho* was conned through, and at last the beach, with its waving and yelling little party of castaways, was brought into view.

All had survived their appalling ordeal and within an hour all were safely aboard, and the *Yelcho* was steadily steaming her way out through the pack again. Four days later, on September 3rd, 1916, they landed at Punta Arenas in South America, from where they travelled up the continent by railway, finally sailing for home from Buenos Aires. Upon arrival every man volunteered for war service at sea.

CHAPTER IV

SHACKLETON, meanwhile, still had upon his mind the responsibility for the other half of the Trans-Antarctic Expedition which he had conceived and launched. This was the party which had gone to the Ross Sea in the *Aurora*.

The task of this party under Captain Mackintosh had been to lay depots from McMurdo Sound to the head of the Beardmore Glacier in order to provision Shackleton after he had passed the Pole on his trans-continental journey.

This task they carried out to the letter in spite of heartbreaking conditions and appalling bad luck.

They made a landing at Cape Evans, Scott's old base, and there directly sufficient stores for their purpose had been unloaded the ten-man shore party set off about the laying of their first depot. Mackintosh was keen to get as much of the work done as possible during the autumn, since the lives of Shackleton and his party depended on their getting the task completed within the allotted time.

While the party was away the rest of the stores should have been unloaded from *Aurora*, since it had been intended that she should stand by throughout the winter. But the ship was driven from her anchorage by a succession of heavy gales and was finally frozen solid in the pack-ice where she had to lie helpless throughout the winter months.

The position of the depot-laying party when they got back to Cape Evans and found the ship gone was about as bad as it could be, for the stores which had been landed from the missing ship had disappeared as well. Moreover, the appalling weather conditions had already cost them dear and a large number of their dogs had died.

They were marooned on the edge of the coldest and loneliest part of the world without a coal supply and without most of the heavier clothing and sledging equipment they had brought.

However, they wasted no time in bewailing their fate, or even in thinking about it. They rummaged in the old huts left by Scott and Shackleton on previous expeditions, and found an amount of gear and food which, with their own efforts at hunting, kept them going. After the winter night had passed they resumed their depot-laying and finally got the last one planted at the end of January 1915.

Their task was accomplished—but at the heavy cost of three lives. Spencer-Smith died of heart failure after having suffered agonies of scurvy. Mackintosh and Hayward were drowned when crossing treacherous ice between Hut Point and Cape Evans.

Ernest Joyce, a veteran of Antarctic exploration, became leader of the remainder of the party which endured yet another winter on the ice before they were rescued.

Shackleton and Worsley set off to the relief of the Ross Sea party directly the castaways of the *Endurance* had been picked up from the tiny Elephant Island beach. The two sailed for New Zealand, where they found the *Aurora* ready for sea again after necessary repairs to the damage she had suffered during her nine months in the ice-pack. They steamed south and finally picked up Joyce and his six followers at the beginning of January 1916.

These men, too, all volunteered for war service directly they returned to civilisation.

This was Shackleton's last expedition, although after war service in North Russia, he organised another which bore the name of Mr. J. Q. Rowett, who provided the finance. His old companions Wild and Worsley joined him in the 125-ton *Quest*, which sailed south in the summer of 1921.

While the ship was at anchor in Grytviken, South Georgia, Shackleton died suddenly of heart failure. He had lived only forty-six years, but of those he had given twenty-two to exploration. He discovered more new land than any man before him, and the maps he made were accurate and reliable. From a happy-go-lucky, foot-loose wanderer he developed into one of the most brilliant leaders and organisers of scientific investigation the world has known. Moreover, in spite of the failure of his biggest expedition, he never lost the life of a single man under his personal command.

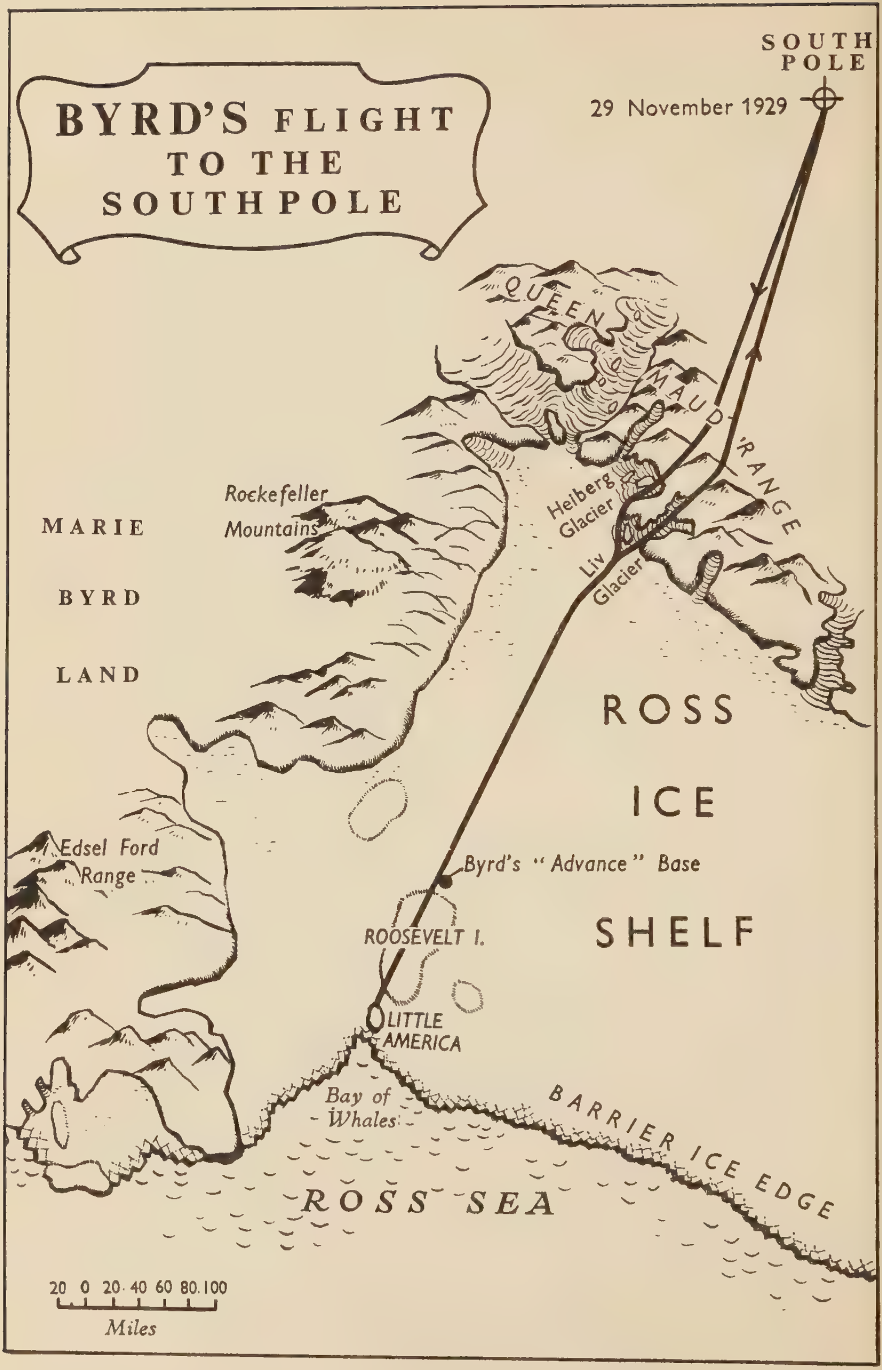
One of his most admired comrades, Dr. Hussey, in an appreciation of his life quotes one of his favourite verses:

> " How dull it is to pause, to make an end
> To rust unburnish'd, not to shine in use . . ."

Shackleton's end came tragically early but he made it, if one may use the word, in the one place in the world where the true mettle of his character shone most brightly. He was buried at the foot of the snow-covered mountain over which he had led Worsley and Crean after their 800-mile voyage across the Antarctic Ocean in the frail little *James Caird.*

Nowadays, it is unfashionable to discuss the English character in terms of the enterprise, drive and fortitude which founded a Commonwealth. Shackleton saw the thing quite simply. He could never be bothered with any matter of heroics, and would turn the subject with the mere remark:

"But I *expect* Englishmen to be brave . . ."


BYRD'S FLIGHT TO THE SOUTH POLE
SOUTH POLE
29 November 1929
QUEEN MAUD RANGE
Heiberg Glacier
Liv Glacier
Rockefeller Mountains
MARIE BYRD LAND
ROSS ICE SHELF
Byrd's "Advance" Base
ROOSEVELT I.
LITTLE AMERICA
Edsel Ford Range
Bay of Whales
BARRIER ICE EDGE
ROSS SEA
20 0 20 40 60 80 100
Miles

Part Four

BYRD

CHAPTER I

ALTHOUGH Ernest Shackleton laid the foundations of modern scientific exploration he knew that he and the men who had gone before him had done little more than touch the surface of the problem to be solved. The answers that science demanded now lay beyond anything that could be achieved by men equipped only with dog-teams and flimsy tents. Indeed, to use a colloquialism, the useful day of the "shoe-string" expedition ended with his passing. Little further was likely to be achieved without the most important tool of all—money: money in large quantities to provide specially-strengthened steel ships—solid buildings—properly-adapted mechanical transport—and improved wireless communication.

However, after his death in the early twenties, Britain began drifting into the financial slump that followed the first World War. Unemployment was reaching astronomical figures. To avoid widespread starvation, doles had to be paid out to workless millions. Those fortunates who had capital kept it locked away. Any man who had tried to raise money for a Polar expedition would have been told: "There *isn't* any here. Go and try the Americans. They've got it all."

This was, in broad outline, true, for America, as the arsenal of the democratic world, had made enormous profits. It is not surprising therefore that America launched the next attempt to solve Antarctic problems. This was the first, really lavishly-equipped expedition in history, and it brought into the field a special piece of equipment that had not been developed sufficiently for use in Polar work while Shackleton lived. The aeroplane.

In the year 1928 a young American announced that he was going to attempt to fly to the South Pole. In order to do this he had provided himself with not one, but three aircraft—a big 1,000-horse-power Ford tri-motor, a Fokker and a Fairchild. For his operation he was taking not one hut, but a small township

Richard E. Byrd, first man to fly over both Poles. (A 1929 photograph.)

February 16th, 1947. Flying over the South Pole, Byrd drops a carton with flags of each member of the United Nations.

FUCHS–HILLARY EXPEDITION

Above: Aerial view of stores-dump at foot of rise leading to Shackleton Base.

Below: Dr. Vivian Fuchs (with sun-glasses) digging in the ice for water to take aboard the *Theron.*

of specially designed and pre-fabricated buildings, all of which would be lit by electricity and served by a telephone system from a special generating supply.

His winter party numbered forty-two and the complement of his main expedition thirty-two men. Four ships were necessary to carry the mass of their equipment to New Zealand, from where they were reshipped through the ice-pack to Amundsen's old base in the Bay of Whales.

There, at the end of December, this virtually enormous camp was set up on the Barrier Ice, and 65-foot radio masts were erected to keep touch with "walkie-talkie"-equipped sledges for which he had provided a hundred dogs.

To top off the picture the expedition was also equipped with motor-boats, a tractor and an array of mapping and cinema cameras—the whole outfit being valued at somewhere around £200,000.

It seemed that a partnership of Hollywood and typical American big business had decided to put Antarctica on the map. The young leader himself had film-star good looks. But he had something else which made even crusted veterans of exploration hesitate about cracking obvious jokes. When he set foot on the Barrier Ice, young Richard Byrd had the record of having already flown over the North Pole, flown across the Atlantic from New York to France, and of having organised and led a brilliant aerial survey of the Greenland ice-pack.

In point of fact, for all his romantic good looks and background of American high-pressure organisation, Richard Byrd was a quiet-mannered, sensitive man gifted with high intelligence as well as outstanding courage. Son of a comfortable Virginian family of considerable social standing, he entered the United States Navy, qualified as a pilot at Pensacola in 1917, and flew on anti-submarine patrols in Nova Scotia, where he rose to command a station.

From the first he proved himself a brilliant navigator. After the war was over he was appointed Navigation Officer to the team of N.C. flying-boats which made the first-ever crossing of the Atlantic Ocean, by stages. Byrd flew in one of the craft on the first two spans of the historic crossing.

Some years later he was sent to England with the crew who were to join a British airship, which was to be flown to America. By a matter of chance he was not on board the ill-fated airship when it was wrecked over the River Humber and crashed with the loss of forty-five lives.

On his return to America, Byrd, then a lieutenant-commander, discovered that like most other regular officers he would have to drop his war-time rank and revert to that of lieutenant. Prospects of rising again in a naval career seemed a long way ahead, whereas civil flying offered readier prizes.

Byrd therefore transferred to the inactive list and, in 1925, organised his North Greenland expedition. In the course of this, with Floyd Bennett as co-pilot, he flew well over 2,000 miles, as a result of which both men became convinced that a flight to the North Pole itself was a practical possibility.

This flight they accomplished in the following year in a virtually old Fokker three-engined monoplane which had already logged some 20,000 air miles. Byrd decided on Spitzbergen as a final base, since it was only 720 miles from the Pole, but when he and his party got there they found the need for fast work. Roald Amundsen and the Italian General Nobile were expected almost hourly in their rigid airship *Norge* bound for the same goal.

Byrd and his party therefore worked like beavers. Having landed on April 29th, they had smoothed and cleared the only available space for a runway by May 8th and, at half an hour after midnight, managed to fly the heavy aircraft off. Then they flew a straight course over the vast ice wilderness until: "At 9.02 a.m. May 9th, 1926, Greenwich civil time, our calculations showed us to be at the Pole. The dream of a lifetime had at last been realised ... we went on for several miles and made a large circle to be sure to take in the Pole. Thus we made a non-stop flight around the world in a very few minutes. In doing that we lost a whole day in time; and of course when we completed the circle we gained that day back again. ... The elements were surely smiling that day on us, two insignificant specks of mortality flying over that great white area in a small plane. ... Speechless and deaf from the motors, just a dot in the centre of 10,000 square miles of visible desolation. ... We felt no larger than a pinpoint and as lonely as the tomb; as remote and detached as a star."

After a safe return to Spitzbergen, Byrd submitted his charts and records through the Secretary of the United States Navy to the National Geographic Society. The Society's report ended:

"We have carefully examined Commander Byrd's original records of his observations en route to and from the North Pole.

. . . We have verified all his computations. We have also made a satisfactory examination of the sextant and sun compass used by Commander Byrd.

"It is the opinion of your committee that at very close to nine hours three minutes Greenwich Civil Time May 9th, 1926, Lieutenant-Commander Richard Evelyn Byrd was at the North Pole in so far as an observer in an airplane using the most accurate instruments and methods available for determining his position could ascertain."

Byrd and Bennett therefore became the first men to fly over the North Pole, beating Amundsen by only a very short time. The great Norwegian explorer bore them no grudge, however. On the contrary, he became one of Byrd's warmest admirers and friends. Before he took off with Nobile on the *Norge* airship (in which he too passed over the Pole, but continued on to land in Alaska) he sincerely congratulated Byrd and asked, "What now?"

Typically, Byrd answered: "Now for the South Pole."

The answer delighted Amundsen, who forthwith promised to give any advice or help in his power. This promise he kept to the letter when the time came, giving the use of his own equipment and suggesting the best ship for the purpose—the *Samson*, which Byrd afterwards bought and renamed *City of New York*.

Immediately after the North Pole flight, however, Byrd decided to make reality of another of his cherished dreams. This was to be the first man to fly a passenger-carrying aircraft across the Atlantic non-stop from New York to Paris.

At that date the Atlantic had been flown first in stages by the N.C. flying-boats, of which he had been Navigating Officer, and later flown non-stop in a Vickers bomber aircraft by the Royal Air Force Officers, Alcock and Brown, who crossed from Newfoundland to Ireland.

It was Byrd's belief that big aircraft such as the tri-motor of his Polar flight had improved so much in design and reliability that an actual passenger service across the Atlantic was a practical possibility. He was, of course, over-optimistic and thinking ahead of his time in terms of aircraft design and engineering, but as a born pioneer he was determined to put his idea to the test.

He almost succeeded. With a crew of five, again in a big three-engined Fokker, he flew from New York to a point where navigation indicated that they were directly over Paris. There, owing to cloud which reached practically down to ground level, the crew were forced to turn and search for a landing-place. Finally, at the end of their fuel supply, they landed in the sea a few yards from the beach of Ver-sur-Mer.

It had been a magnificent attempt, but for Byrd it was a double disappointment. In the first place, he had had to make the flight without his great friend Floyd Bennett, who had been injured in a crash when the machine was being test flown, and had subsequently died. In the second place, he had been beaten in priority of time by Colonel Charles Lindbergh, who had made the direct crossing from city to city in one of the most magnificent solo ocean flights of history.

Nevertheless, in those days there were few living men who had flown across the Atlantic Ocean—although even by then there were a great many who had lost their lives in the attempt—and Byrd, who had also the North Pole on his flying log, stood almost level with Lindbergh in his country's esteem.

He had by no means forgotten his promise to Amundsen on that triumphant day in Spitzbergen. He subsequently wrote:

"My interest in the South Polar region dates from far back and seems almost to have been synonymous with the names of Scott and Peary of whom I had heard a great deal in my youth."

Throughout the following year he was busy canvassing financial support, gathering equipment, picking men and laying down the basic organisation for a South Polar flight.

CHAPTER II

On September 28th, 1928, Byrd wrote: "The time is up. The last dollar that I can beg is raised. Four ships with most of our equipment on board are already on their way headed for New Zealand. In their holds and on their cluttered decks are over 500 tons of supplies and materials; there are at least 5,000 different kinds of things ranging from thumb tacks to airplanes, and every single thing is essential in one way or another to our unrelieved stay in the Antarctic. . . . None of us has rested. Nearly all are exhausted. We have been stimulated by the knowledge that the battle ahead in the frozen world will be won or lost by the battle of preparation."

That preparation was vast in comparison with all that Captain Scott or Shackleton had been able to gather. The circumstances, of course, were beyond comparison, since at that time America, after having been the world arsenal throughout a war which had impoverished most other civilized countries, stood enormously wealthy. Byrd had been able to appeal to the generosity of multi-millionaires, whereas the British explorers had only the backing of men rich by the far smaller European standards.

Yet although his great armoury of equipment was brilliantly handled, although it was brought into use, administered and directed on the most efficient of big business lines, Byrd started south with the most important factor crystal clear in his mind.

That factor had been expressed to him by Amundsen when they had discussed the attempt at Spitzbergen:

"Most earnestly he warned me to look to my men: 'Men are the doubtful quantities in the Antarctic. The most thorough kind of preparations, the shrewdest plans, can be destroyed by an incompetent or worthless man.' In the same temper, but in different words, the warning was repeated to me by a distinguished British explorer, an executive officer on Scott's last expedition: 'The first man who starts trouble of a disloyal nature deserves the worst death you can think of.' On expeditions of this kind one good man is priceless; a disloyal one is soon found out, and his comrades live to damn him and rue the day he was born."

In short, Byrd knew well that, no matter how luxurious his equipment might be, it would be only his own power of leadership to inspire his men to endurance and fortitude which could mean success.

His largest aircraft was a tri-motor Ford metal monoplane capable of lifting 15,000 lb. and cruising at just over 100 miles an hour. He also had a Fokker and a Fairchild as we have noted.

After landing stores on the Barrier Ice in the Bay of Whales in December 1928, the great mass of the expedition's material was moved piecemeal by dog teams to a point about 5 miles south, where the various houses were erected. "Little America" gradually came into being. Wireless masts were set up and tested; a labyrinth of tunnels was dug both for communications between the buildings and for storage and winter housing of the dogs; the aircraft were brought ashore, assembled and tested.

On January 27th, 1929, Byrd took off on his first Antarctic flight with Balchen (who had been with him on the Atlantic flight) and June. As a preliminary to the Polar attempt this was a test flight to include discovery. Byrd wrote:

"Eastward of Little America lay a first-rate geographical problem; and all the time that we were bending our backs to the monotony of unloading the ship and establishing our base my mind was on it. . . . A run of 30 seconds lifted us clear of the snow and a few minutes later Balchen, June and I were gazing down upon untrodden areas. . . . Visibility was about 40 miles. I laid my course directly for Scott's *nunataks* which were nearly 200 miles away."

Having passed the *nunataks*, Byrd was exploring new land at the rate of 4,000 square miles per hour. He mapped a chain of small mountains leading to the south-east and then, far ahead, a high peak showing bare rocks. More peaks appeared as the aircraft droned on, so that eventually they counted fourteen. This range Byrd named in honour of John D. Rockefeller Junior, one of his backers.

Then, with an eye on their fuel, the party turned for home. Unloading was still in process and stores were being hauled up on to the barrier by a tackle powered from the winch of the ship *Bolling*. This went well until the following Wednesday when, without warning, a mass of the barrier calved, and tons of solid ice crashed down upon the ship's deck with such force that she was heeled over almost on to her beam ends. By something like a miracle there were no casualties and, in spite of "an iceberg having been born almost on her decks", the ship received only superficial damage and was later able to return to New Zealand.

By the beginning of March all material had been hauled to the Little America base, and the remaining ships had left the party and steamed north. The long Antarctic winter with its four months' night was close at hand, but before going to ground Byrd, rather against his will, allowed a geological party under Dr. Gould to fly out to investigate the newly discovered Rockefeller Mountain. Gould, Balchen and June took off on the 7th of the month for a week of scientific work, but almost at once the weather broke. The party kept in radio touch with base until the 15th, after which there was silence.

By the 17th Byrd was very badly worried. The three had gone off in the single-engined Fokker, since the big Ford tri-plane was being reserved for the Polar attempt. They had two separate radio sets on the aircraft, so their prolonged silence seemed to presage the worst. To add to Byrd's anxiety, the weather steadily worsened and it was not until the 19th that it cleared sufficiently for him to get away in the Fairchild aircraft with a radio operator on a rescue attempt.

In his own words: "There was the dreadful possibility that we should not be able to see anything. A shattered plane and three men would not be conspicuous."

At Gould's last given position they began searching the slopes and the valleys of the mountains. "If we failed to find them here, then we faced the heartbreaking task of combing 70 miles of mountain peaks. A more hopeless task I could not imagine."

When things seemed most futile and sheets of drift were sweeping up, the stranded aircraft was spotted, with a tent pitched beside it. Byrd landed at once and was so relieved to find his three comrades safe and sound that he ordered Balchen and June into the aircraft to fly back to base, and himself stayed at the spot with Gould.

The geological party had reached that point on the day they started after about two hour's flying. They pitched camp and lashed the aircraft down to pegs, intending to start their geological work the next day, but from then on the weather turned so bad that they could neither carry out their investigations nor attempt to fly the machine off.

For a few days the little party kept in touch with headquarters by the radio set in the aircraft, but then a gale began to blow, rising steadily in strength until the lashings holding down the landing-skis were carried away.

Staggering in the teeth of the blizzard, the party worked frantically to anchor the machine. It was now lifting and crashing down again in the force of the wind, which was turning its propellor briskly. They cut snow-blocks and piled them on the skis, driving in fresh pegs and renewing the lashings.

Finally, the driving gale roared up to typhoon force. June, who was trying to work the radio in the cockpit, felt the big machine tearing clear of her moorings again. In his own report:

"The needle on the airspeed indicator touched 88 miles an hour and although she only banged up and down on the snow, the ship was certainly going through all the motions of flying. I looked out and saw Gould hanging onto a rope attached to one of the wing tips. He was blown straight out like a flag. The prop was turning over very fast . . . but the wind then was only working up to bigger and better things."

By now the party had worked themselves to a dangerous pitch of exhaustion and Dr. Gould knew that whatever they did they could never anchor the machine securely unless the wind dropped. He therefore ordered all hands into the tent, where they crawled helplessly but thankfully into their sleeping-bags.

But the typhoon wind roared to greater and greater fury. Gould judged some of the gusts as reaching over 150 miles an hour. In one of these the heavy aircraft was finally torn from its moorings altogether.

"The plane burst free, rose into flight and flew backwards for half a mile, then crashed upon the ice, a complete wreck. Balchen, a man who never gives up, battled against the wind to reach it and came back with the news they had verified with their own eyes—the Fokker would never fly again."

It was not until next day, when the wind dropped—in June's words: "When it stopped it was so quiet that it hurt"—that they could go out, climb into the wreckage and try to re-contact base on the emergency radio set. Then they had to endure the final blow of fate. The generator crank-shaft broke and, as they looked at each other in silence, the same thought was in the minds of all.

Their chances now were slim. Drift had already covered the wreck with a mantle of white, and half buried their tent. They could only wait and hope that they would be spotted in that vast white waste by the eyes of a flying search party who would have all the range of desolate mountains to cover.

As Byrd heard this grim story from Gould he made a firm decision never in future to be persuaded to authorise any expedition which he felt by instinct was hazardous. Chances would have to be taken—the whole effort of the forthcoming Polar attempt was a gamble in which their lives were staked against the efficiency of machinery—but that was a calculated gamble which had been planned to the last detail. A ground organisation of depots and supporting parties had been schemed to cover a forced landing, even as far south as the Pole itself. Nothing had been left to chance as in this present instance.

A relief aircraft flew out and picked up Byrd and Gould the next day and, as Little America once again came into view, Byrd felt a quiet confidence in the future. His men were luxuriously housed, according to Antarctic standards. They had the long winter in which to prepare equipment and perfect plans. When spring brought weather that would make the attempt possible, he felt the only hazard would be a straightforward crash which could, in a second, cost the flying crew their lives.

That was the only gamble he was prepared to accept for himself or the men with him. And it was a gamble he very nearly lost.

CHAPTER III

WITH the approach of spring there was feverish activity in getting the two surface parties ready for their journeys. As in Amundsen's case years before, there was trouble with the dogs which had been safely and warmly housed in their tunnels throughout the winter.

"They were so overjoyed to be above ground once more . . . that they ran about the camp like lunatics." wrote Byrd . . . "Crockett started off with six dogs. Instantly they dashed around in a mad circle slamming the sledge around as if it weighed nothing at all, while Freddy yelled and cursed and tried to hold onto the careening sledge. In the midst of these evolutions the dogs suddenly sighted the entrance to their tunnel, and with impish perversity raced right down carrying sledge, Crockett and all. It was a frightful tangle."

The supporting party were away first in the middle of October. Their task was to penetrate as far as possible southwards, dumping food depots for the geological party which started a fortnight later.

Apart from Byrd's own flight to the Pole the geological party of the expedition made a fine achievement. They explored the foothills of the Queen Maud range of mountains at the edge of the Polar Plateau itself, and marched into the eastern fringe of Marie Byrd Land, thereby becoming the first Americans to discover and claim for their nation new land in the area of the South Pole. In all they covered 1,500 miles, carried out a mass of geological investigations and spent more than two and a half months in the ice wilderness.

Marie Byrd Land, the leader named for his wife, "who has backed and helped me every foot of the way, who has shouldered much of the burden of the expedition, and whose understanding has made my many expeditions possible".

On Monday, November 18th, Byrd decided that weather conditions were good enough for a first test flight south which was to include the laying of a food depot for the geological party at the edge of the Polar land-mass. The big Ford aircraft took off at 9.40 a.m., with Smith as pilot, June as co-pilot and radio operator and McKinley as cartographer. Visibility was perfect in a cloudless sky. The temperature was practically above zero, and wind almost non-existent. With the load for the depot, the aircraft was carrying well over 14,000 lb., but from the moment of take-off Byrd was worried about what kind of surface he would find at the other end of the journey for the purpose of landing.

After a while it was found possible to follow the trail of the support party, which showed as a thin, uncertain scoring of the snow surface. The low position of the sun threw long shadows from the various intermediate depots which made them easy to pick up. Before long the aircraft passed over the men of the support party, toiling along the trail. Byrd noted: "The poor devils we saw quickly were having a hard time. Some of the men were in harness pulling with the dogs . . . they had their toes dug in and the dogs had their bellies to the snow trying to keep the sledges moving . . . we passed them at 300 feet swinging low in salute and caught sight of two or three white faces lifted up. If ever a conclusive contrast was struck between the new and the old methods of Polar travelling it was then. We dropped them a bag of letters and miscellaneous equipment and continued on."

Finally, after a search for the smoothest possible landing area, they chose a spot at the foot of the Liv glacier. Smith took the aircraft down, flattened out, and finally rammed the throttles open, nosing up into a power stall. It was a brilliant piece of airmanship which brought the heavy craft to a touchdown at only about 50 miles an hour. Although the snow was much more uneven than it had appeared from the air the landing could not have been better, and the Ford finally slid to a standstill on its skis, undamaged.

The first big hazard had been surmounted. Everyone's spirits rose as they tumbled out of the machine and began piling the supplies into a cairn, built as high as possible so that it would stand firmly. Smith alone remained in the aircraft to keep the engines ticking over and the oil warm and circulating.

Then they were off again, climbing to 3,000 feet, when Byrd set a course due east. His aim was to photograph and map the Queen Maud Range, but a suddenly discovered shortage of petrol put this out of the question. There was nothing for it but to turn and take the straightest possible course back to Little America. Before doing so, however, Byrd made a careful survey of the possible routes leading up to the 10,000-foot-high plateau. There were two—the Axel Heiberg and the Liv glaciers, down which rivers of furrowed ice made their way to join the landward side of the great Ross ice-barrier. At that moment Byrd made a mental note that the Liv seemed to offer the better chances for climbing a heavily loaded aircraft up above the land-mass on the actual Polar journey—for, heavily loaded it must be with the gear, the sledges and the supplies that would be necessary if they made a crash landing and were forced to return on foot.

As things turned out, it was a wise decision, but meanwhile at a point about 100 miles from Little America the engines of the big Ford began to misfire, and then suddenly ceased altogether. With propellors idling Smith had to bring the machine down to a second landing. This he managed as skilfully as the first, and directly the machine had come to a standstill the crew set to work to empty the oil out of the still-warm engines so that it would not congeal. June, meanwhile, tried to get base on the hand-operated emergency radio set, but could not make contact.

Now the position looked grim, and everyone knew it. The cause of the petrol failure was a leak in the pump system which June repaired as a matter of course; but he and everyone else knew that all their lives were now at stake in a blind gamble with the weather.

Since they had been unable to contact base and could not give their position, the chances of rescue were poor. There was just a hope that they might make the 100-mile journey on foot with what little equipment they had—if the weather remained as miraculously fine as it had been all day. If the gamble went against them and a sudden blizzard blew up, their aircraft and any tents they might erect would soon be blotted out, invisible from the air, and quite hopeless for any land party to discover.

But about two and a half hours after they had landed the party caught their breaths as they heard a sound they could hardly believe. It was the sound of an aeroplane, and out of the northern sky the Fairchild machine appeared, to circle round and land close beside them.

Balchen and Petersen were on board, and with them they had brought 100 gallons of petrol. They explained that they had managed to keep a rough track of the big Ford machine from its regular transmissions until it force-landed. After that they heard nothing, since the emergency transmitter had not been functioning properly. It was evident to the Base party therefore that the big machine had gone down. Knowing the vagaries of the weather, it had been decided to take no chances, but to fly out 100 miles and look for them forthwith.

In such circumstances nobody minded the strenuous, freezing work of heaving petrol cans up on to the high wing of the Ford and slopping fuel into the tanks. Soon both aircraft were on the wing again and, within an hour, safely back at Little America.

CHAPTER IV

One week later, after the Ford had been carefully overhauled, Byrd set out on the flight to the Pole. Balchen was at the controls with June as his co-pilot and radio operator. McKinley was given pride of place with his mapping cameras, and Byrd sat at his navigation table, aft. Apart from the crew, the total gear loaded into the aircraft weighed around 15,000 lb.—and the biggest problem that lay ahead was that of climbing the overloaded machine above the 10,000 feet of height necessary to get it over the plateau.

Byrd in his personal account gives a vivid picture of the interior of the machine: "With the profusion of gear in the cabin there was a small sledge, rolled masses of sleeping bags, bulky food sacks, two pressure gasoline-stoves, rows of cans of gasoline packed about the main tank forward, funnels for draining gasoline and oil from the engines, bundles of clothing, tents and so on *ad infinitum*. There was scarcely room in which to move."

Setting a course straight along Amundsen's trail of 1911, he thought of the fact that Amundsen's party at their best had averaged 25 miles per day. He and his crew were now scheduled to average 90 miles an hour to reach the same objective. "We had the advantage of swiftness and comfort, but we had as well an enlarged fallibility. A flaw in a piece of steel, a bit of dirt in the fuel lines or carburettor jets, a few hours of strong headwinds, fog or storm—these things remotely beyond our control could destroy our carefully-laid plans and nullify our most determined efforts. Still, it was not these things that entered our minds, rather it was the thought of the 'hump' and how we should fare with it."

At full throttle the Ford was climbing slowly but steadily. A few minutes after nine o'clock, at a height of about 9,000 feet, Byrd set a course through the portal of the Liv glacier. Of this pass to the uplands he knew no more than what his previous brief observation had told him. The Axel Heiberg glacier lay to the left, and he knew from Amundsen's own report that its lowest part, which offered a pass through to the plateau, was all of 10,500 feet. There was slight cloud over the Heiberg, which strengthened his purpose in attacking the Liv, but whether his decision was to mean success or failure was anybody's guess.

In his journal he wrote that, after a check of petrol consumption, "we had then enough gasoline to take us to the Pole and back . . . the glacier floor rose sharply in a series of ice falls and terraces, some of which were well above the altitude of the plane. These glacier waterfalls some of which were from 200 to 400 feet high seemed more beautiful than any precipitous stream I have ever seen. Beautiful yes, but how rudely and with what finality they would deal with steel and duralumin that crashed into them at 100 miles per hour! Now the stream of air pouring down the pass roughened perceptibly. The great wing shivered and teetered as it balanced itself against the changing pressures . . . the altimeters showed a height of 9,600 feet . . . nevertheless there were indications we were near the surface ceiling of the plane . . . it was an awesome thing creeping (so it seemed) through the narrow pass with the black walls . . . higher than the level of the wings. . . . Balchen held the climb almost to the edge of a stall, but it was clear to both of us that he could not hold it long enough. Balchen began to yell and gesticulate and it was hard to catch the words in the roar of the engines echoing from the cliffs on either side. But the meaning was manifest. 'Overboard—Overboard'."

Byrd shouted an order and two 125-lb. food-bags were heaved out through the trapdoor of the fuselage. With 250 lb. gone away—enough to feed the whole crew for a month—the aircraft climbed again. The Polar Plateau came into sight between the twin crags at the peak of the pass, and at last, with just 500 feet to spare, the big Ford droned out over the vast white plain with no known obstacles lying between it and the South Pole, less than 300 miles distant.

Byrd noted that "the character of the plateau surface varied from time to time. There were stretches of smooth soft snow, colonies of domed haycocks and arrow-headed sastrugi. From the time we had first struck across the plateau its level appeared to slope gently towards the Pole . . . it was difficult to believe that two decades or so before, the most resolute men who had ever attempted to carry a remote objective, Scott and Shackleton, had plodded over this same plateau, a few miles each day, with hunger, fierce unrelenting hunger, stalking them every step of the way".

Soon Byrd was busy with his chronometers, drift indicators and compasses, for his previous dead-reckoning and "shooting" of the low sun told him that they were getting close to their objective. Now the weather began to thicken, and Balchen drew his attention to storm-clouds gathering to the left. Finally, at 1.14 by Greenwich time, sights and calculations confirmed that they were directly over the South Pole.

As Balchen circled the aircraft, Byrd dropped overboard a flag weighted with a stone from Floyd Bennett's grave, and also British and Norwegian flags in honour of Captain Scott and Roald Amundsen, the only men who had reached the most lonely and desolate point on earth on their feet.

In Byrd's own words: "The Pole lay in the centre of a limitless plain. To the right, which is to say to the eastwards, the horizon was covered with clouds. If mountains lay there, as some geologists believed, they were concealed and we had no hint of them. And that in brief is all there is to tell about the South Pole. One gets there and that is about all there is for the telling. It is the effort to get there that counts. We put the Pole behind us and raced for home."

It was a race home in which they had to beat the gathering storm coming up from the south. But with the wind astern the aircraft was making 125 miles an hour. Byrd set a course slightly to the east in order to cover new ground for McKinley to photograph.

Now with good height in hand he decided to fly down on to the barrier through the Axel Heiberg Pass, and this was negotiated soon after four o'clock. Finally they landed at a previously prepared base to re-fuel from a stack of cans which had been piled there. The delay brought the racing storm close up behind them, but they got away safely, and by ten o'clock were sliding to the end of their landing-ground at Little America.

Byrd's final note on the epic flight is typical of him:

"Well, it's done. We have seen the Pole. McKinley, Balchen and June have delivered the goods. They took the Pole in their stride neatly, expeditiously and undismayed.

"If I had searched the world I doubt if I could have found a better team. Theirs was the actual doing. But there is not a man in this camp who did not assist in the preparation for the flight. Whatever merit accrued to the accomplishment must be shared with them."

On the 5th of the next month he set out on the survey flight to the eastward which he counted to be the most important of all. To reach the Pole was, of course, a venture which no explorer could have denied himself, but the Pole had been reached on foot already by the two men Byrd admired above all others. The journey to the east was one of fresh discovery for his own part and, moreover, a section of it was already being covered by his geological party on foot, who would thus be able to make America's first land claim in the Polar solitude.

A flight over the same area would be of great scientific value as well as of enormous interest, since it would cover a field gigantic in comparison with what the sledging party could even see, and mapping and photography would vastly elaborate their actual discoveries.

With Parker as pilot and June and McKinley at their normal tasks, Byrd started eastward, climbing to about 2,000 feet. Soon after one o'clock they had passed over the eastern boundaries of the British Antarctic territory and "we were advancing at the rate of 100 miles per hour over an area which had been unseen before, unknown and unclaimed. Here was the romance of geological exploration; and seeing this land at last after so much hoping and trying brought deep satisfaction . . . of all the flights I have ever made none was so full of excitement and profit as this one . . . for here was the ice age in its chill receding tide. Here was a continent settled and overwhelmed. Here was the lifeless waste born of one of the greatest periods of refrigeration that the earth had ever known. Seeing it one could scarcely believe that the Antarctic was once a warm and fertile climate with its own plants and trees of respectable size."

On that flight Byrd mapped 400 miles of the barrier line and coastline which had never been surveyed before. He discovered the land to which he gave the name of his wife, and the great range of mountains which he named after Edsel Ford, who had been a generous and consistent supporter of his expedition.

And with that, and the close of the brief Antarctic summer, the work of the first Byrd expedition virtually came to an end. There lay only the final task of packing up and clearing camp, but the supply ship struck unusually heavy weather and it was not until the end of February that the last of the expedition was finally homeward bound.

As Byrd made his way down across the ice with Haines, the meteorologist, he glanced back over his shoulder and smiled.

"We'll be back, Bill," he said.

Haines shook his head definitely.

"Not me. Once is quite enough."

Both men were of the true stock of which explorers are made. Four years later both of them stood grinning at each other on that same spot.

Byrd had nothing as spectacular as a Polar flight in mind when he returned to Antarctica for the second time. His main object was to survey and map accurate details of Marie Byrd Land, the first area of Antarctica to be brought under the American flag, which he and his first expedition had discovered and claimed for their country.

Indeed, he considered his flight to the Edsel Ford and Rockefeller Mountains in this area far more important than his actual flight to the Pole.

In addition to this, however, he had always been fascinated by the vast unknown segment of land and coastline known as the Pacific Quadrant in which Marie Byrd Land lies to the eastward of Little America.

This is the quadrant of ocean, ice and mountain lying roughly between the 120th and the 150th meridians of west longitude. At the time of Byrd's second expedition the only man to have sailed a ship across the Antarctic Circle in the Pacific Quadrant had been Captain Cook in 1773. Cook, it will be remembered, had gone on his way convinced that there was no land-mass in the south at all. The whole region, therefore, and especially the coastline, was a blank on the charts.

A legend had grown up, however, that a great peninsula of land or archipelago of islands extended northward from Edward VII Land between the 150th and 140th meridians. Byrd, from his own observation of the movement of the ice-pack, doubted that this existed at all. In any case he was determined to find out, and now set about the task with a typically efficient organisation to handle a massive collection of equipment.

By ship he planned to penetrate as far east into the ice-pack off the unknown coast as it was possible to go. From that point he would make still deeper surveys by an aircraft carried on board. Then, before the end of the short summer season, ship and aircraft would turn back westward for the Bay of Whales and a new headquarters at the original Little America base, from which in the next season further explorations would be made by air, by tractors and by sledging parties with dog-teams.

During the intervening winter season he had a project in mind which was without parallel in the history of Antarctic exploration. This was the mounting and manning of an advance base at a point a couple of hundred miles south of Little America on the route to the Pole. There, with only two companions, Byrd planned to stay throughout the long months of winter darkness in what was known to be the coldest temperature on the surface of the earth, in order to get specialised records of meteorological conditions.

When the expedition left America at the end of September 1933, Byrd had acquired two ships. One, the *Bear of Oakland*, was an elderly ice-breaker which had already had a colourful career both in the Arctic and Antarctic and had served in the famous Gold Rush to the Yukon. This stout 700-ton veteran the city of Oakland allowed him to have for a token fee of 1,000 dollars.

The ship he chose to carry his aircraft deep into the eastern pack-ice was a fairly modern, oil-burning, steel-built freighter which he named *Jacob Ruppert*, after one of his financial backers. Hitherto she had worked in nothing more romantic than the Pacific lumber trade, but she was big enough to carry on her afterdeck a big Curtiss-Wright Condor aircraft with an 82-foot wing span. The Condor could be fitted with floats for work from the water or with skis for operations from frozen surfaces. On either equipment it could lift a load of 19,000 lbs. with which it had a range of about 1,300 miles.

According to Byrd, "It was a wonderfully handy exploring instrument with . . . unobstructed vision from all windows, ports for the mapping cameras and . . . capable of lifting the essential elements . . . (mapping cameras, repair kit, emergency rations and camping gear, etc., for the flight crew in the event of a forced landing away from base)."

For the slower earth-bound transport Byrd took 153 specially picked dogs, since hard experience had taught him that "planes and tractors are superb instruments, but there is no getting away from dogs. The Eskimo husky still is, as he always has been, the one absolutely reliable means of polar advance. He can overcome terrain which a tractor cannot penetrate and a plane can't land on".

Even so, although the tractor on his first expedition had been far from successful, Byrd had long been convinced that this was a machine which could be of enormous use in Antarctic work. Indeed, he had hoped to design and build one specially for that purpose, but lack of funds made this impossible. Finally he started out with the gift of two light Ford snowmobiles, an enormous Cletrac which could haul ten tons, and three lighter, faster Citroens.

After calling in at Wellington, New Zealand, for a last clearing and re-stowing of all gear, the *Jacob Ruppert* set off for the unknown areas of the south on December 12th, 1933.

Sailing on a south-easterly course, the ship ran into thick fog almost immediately and stayed in it for well over 1,000 miles. On the 19th conditions cleared for the better and observation showed that they had penetrated further south than Captain Cook had managed 150 years before. Next day they were moving through the first of the ice-pack. Of this Byrd wrote:

"We worked eastward through scattered floes looking for a feasible passage. Remember we had an old iron ship which for years had lain unused in a Government graveyard. Her plates were only $\frac{7}{8}$ inch thick; they were rusty and there was no telling how much of a strain her rivets could stand. We went cautiously side-stepping the heavier floes."

It was not possible to side-step for long, however. The mass of the pack was closing in and the constant thumps and crashes against her sides began to spell real danger. She was hove to, therefore, and the big aircraft was made ready for action and put over the side when a clear stretch of water was reached next day.

With June and Bowlin as pilot and co-pilot at the controls, Petersen at the radio and Pelter to look after mapping, Byrd then made what he had good reason to regard as one of the most satisfactory flights of his whole life.

As they rose from the clear water and thundered away over the pack he was looking for pressure-ice, which was to be expected if the supposed land-mass thrust out from the Antarctic coast in this area. But no pressure-ice could be seen.

This convinced him of what he afterwards proved: "The absence of pack—on the contrary the comparative openness of the sea—strongly argued against the existence of an archipelago or a peninsula of the continent supposed by some to project into this area. If land existed there must have been larger quantities of heavy bay ice than we had seen. After all a steady current with a westerly set was continually wafting pack down from the ice coast to the eastward; and any extensive land mass lying athwart that current was bound to accumulate and dam the immense pack for which this region was fabled."

Byrd kept going to the outward limits of his fuel supply and returned to land beside the ship in perfect weather after a three-hour flight which had reached as far as 69 degrees 51 minutes south latitude. The plane was hoisted inboard, and the ship turned to steam north through a breach in the pack to find clearer water before steaming still further east.

Almost at once the weather worsened. Fog and snow together came driving out of the north-east, and as night came down the look-out reported icebergs looming through the murk on every side. The area in which the ship now lay was afterwards nicknamed, with every good reason, the Devil's Graveyard.

In Byrd's own vivid words: "It lay roughly between the 147th and the 135th meridian along the Antarctic Circle. It was a mood of nature. For days a sleet-oozing gripping oppressive fog, so thick that the bow at times was lost from the view of the bridge lay over the sea. Through that smoky pall like a phantom fleet, prowled icebergs past numbering with the sea throbbing in their basement grottoes. Like a cornered thing the ship stood amongst them, stopped and drifting, or manoeuvring with swift alarms and excursions to evade towering cliffs emerging with formidable clarity out of the gloom which bore down upon her. . . . A more God-forsaken place could not be imagined . . . our position is really critical. Visibility at times dropped to zero and the bergs rise out of the fog with alarming suddenness. You stare into the shifting vapour seeing nothing only dim uncertain shadows. Then cliffs upwards of 150 feet high cleave through scarcely four ship-lengths away. Then the cry floats down from the crow's nest echoed almost simultaneously from the lookout in the eyes of the ship 'Berg on the port bow'. Down in the engine room the engineers on watch spring to their post, the screw turns and the ship sheers away from the menace. This darting to and fro has been going on all day."

This ghastly game of tag in a constant ambush of death went on throughout the next two days and nights. On Christmas morning, to everyone's thankfulness, the fog lifted with the dawn and they were able to steer with clear visibility further eastward along the edge of the iceberg area whilst the watches took their turn to have their Christmas celebration below:

"We had a very satisfying day, the tables in the forward and after saloons groaned under an amazing variety of food. There were movies on the shelter deck, and Christmas boxes, brought months ago, were opened with eagerness and the contents shared all around. . . . I doubt if there was anywhere on this earth a gayer Christmas than was celebrated in The Devil's Graveyard."

Later that day one of the more astonishing of the Antarctic phenomena took everyone by surprise: "Suddenly the fog drained into the sea. It was an eerie experience. One moment we were sliding along a narrow grey corridor, thankful for the lack of bergs. The next moment the fog was sucked away and hundreds of bergs many of immense size cropped up as if by magic. Closely ranked they extended as far as I could see, so numerous that the sea was broken into rivers crossing among mountains of ice. It was Scylla and Charybdis multiplied a thousand times."

It was only a few hours after this, however, that the ship nearly came to disaster. Water in some way had seeped into the fuel oil. When it reached the burner nozzles in the furnaces—the furnaces abruptly went out. Even though the supply was changed over to other tanks and the fires lighted again the steam pressure dropped to half normal. As a result the ship would not answer her rudder and was driven broadside on into the mass of bergs by the force of a rising storm. Somehow, the vessel survived serious collision until full steam gave her steerage way and she could nose out of the worst of the danger.

"Next day the sun broke through and all aboard beheld what is probably the most unique sight on earth. . . . The sea was almost lost for the bergs. There was no end of them. They rose one upon the other like the skyscrapers in a metropolis. . . . In a 24-hour period ending December 28 Dr. Poulter estimated we sighted 8,000 of them. In the evening the sun strove to clear again . . . and all the delicate latent lights—the fine blues, the lavenders, the greens, were awakened in these floating creations. You saw whole cliffs glow with that rare lovely beauty you associate with the light falling through old stained glass in ancient cathedrals. . . . The Devil's Graveyard was very different from the death prowl it had become in the fog."

Still making south and east, the *Jacob Ruppert* pushed on until, by the afternoon of New Year's Day 1934, Byrd decided that he had taken her as far as he dare of conning her out of the pack for the long run westward to the Bay of Whales. She then hove-to at 69 degrees 57 minutes south 116 degrees 35 minutes west, and in a stretch of clear water the aircraft was slung over the side again. Byrd took the same flight-crew with him for this second venture, starting in weather conditions which could hardly have been worse for the purpose of exploration. The cloud ceiling was low, the sun was completely obscured and forward visibility far from encouraging. Snow began to fall steadily as the aircraft thundered away across the water and rose into the air, but having reached his furthest point south-east, Byrd was determined to gain every scrap of added advantage that he might from an exploratory flight.

After circling the ship to check the compasses, the aircraft headed due south along the meridian of 116 degrees 35 west, reaching cloud at only 600 feet. For about 100 miles of straight flight the visibility was never more than 10 miles and cloud-patches often reached "down to the deck". Here flat floes of ice were gigantic in extent, one stretching more than 20 miles wide.

This specially caught Byrd's attention, for "in the middle of that immense slab on which an army could have manœuvred without being cramped were two huge Emperor penguins, the only living things we saw. . . . For no reason at all I was suddenly bemused by the thought that here was the loneliest couple on the face of the earth. I never realised how well off most of us are until I saw my first Emperor penguin".

Apart from the sheer unflinching courage of all who took part in that flight, the limitation of visibility rendered it of very little practical consequence. Finally a horizon black with storm forced Byrd to turn back at 72 degrees 30 minutes south, but on the home run conditions steadily worsened: "The sodden clouds pressed down. . . . Bowlin whose trick it was at the wheel rose into the cloud in search of quieter air . . . the airspeed indicator stopped—ice, of course. . . . He bore down through the clouds and levelled off at 100 feet where the air was warmer. . . . Directly on our course we remembered seeing at least three bergs, two of them over 100 feet high. Others lay scattered through the pack."

Even those who have never piloted an aircraft will realise that flying through fog and drifting snow at 100 feet can be more than alarming when you happen to know that obstacles well over 100 feet high can be expected somewhere in your path.

Byrd and his men, however, were in a worse dilemma than that which has killed so many other airmen. They could not turn aside in the hopes of skirting round known obstacles—for the obstacles were all around. There was no guarantee that even taller icebergs were not lying just beyond visibility to north, south, to east, west. Meanwhile, the ship on which they were homing was a tiny enough object to spot even in clear visibility, and their only possible course was to keep dead on track and (inwardly) to pray.

Their prayers were answered, but only at the last moment, and then after a shock administered by Providence to those who had tempted her too far:

"Out of the mist a black shadow loomed and sprang forward. Bowlin yanked up the nose, the plane rose like a ship's bow flung up by a long wave and the full force of 1,500 horsepower poured into the climb. Some of the rations and gear stowed on the long-side seats came loose. Between the pontoons and the summit of the berg there was just enough room for daylight."

Nobody said anything as, by a hair's breadth, they cleared that grim obstacle for which they had all been straining their eyes.

Shortly afterwards Byrd's brilliant navigation brought them directly over the ship, beside which they landed and were swung inboard. The leader himself admitted that one of the ship's company was right when he greeted them with the words, "You fellows stole one that time".

Once everything was stowed, the ship turned north again and skirted the pack westward until on January 17th, 1934, it came alongside the ice in the Bay of Whales, the nearest point to the old Little America camp, after a total voyage of over 13,000 nautical miles.

There Byrd found a very serious obstruction in the way of his plans, and one which had not previously occurred to him. Although the landing-point was only about 3 miles north of Little America, the surface, in the intervening years, had become ridged, pitted and hummocked, a mass of pressure-ice with peaks rising 30 to 40 feet high. After careful scouting the only possible trail—and that through badly upheaved pressure-ice—from the ship to Little America covered over 7 miles. Along this tortuous trail the dog-teams and the tractors had day by day to haul their heavy loads.

"Somebody called the unloading a white nightmare . . . we lost track of the days and exhausted men lifting themselves from one task to another ceased to heed or remember anything but the compulsion of the work. . . . Literally we inched our way along our misery trail, hauling and relaying, making uncountable thousands of small journeys . . . like so many ants engaged in a stupendous transfer. . . . What drove us was the thought of the ice crumbling behind our backs and the sea creeping hour by hour nearer towards our caches. It was with such drudgery that Little America was regained."

CHAPTER V

WHILE the great mass of material was thus arduously being transported inland, Dr. Poulter, second-in-command of the expedition, was organising the task of rebuilding Little America itself. The two aircraft which had been left behind in 1930 were found practically intact under their covering of snow and ice—and were subsequently dug out in the spring, so that the expedition had four aircraft at its command.

Meanwhile, in opening up the buildings abandoned four years beforehand the party found some astonishing effects of Antarctic refrigeration. On a table stood a plate with a piece of roast beef on it which one of the men remembered constituted a last half-eaten meal he had snatched before leaving. When thawed out, the meat was found to be perfectly sound and eatable. In the dimness of the three-parts buried building the interior of which was hung with icicles that glittered eerily in the beams of torchlight, the breaking-in party were all suddenly startled by an unbelievable sound.

The bell of the wall telephone suddenly rang. The man nearest reached out for the instrument with the remark, "Shucks, did somebody miss the boat when we pushed off last time?"

Through the instrument he heard the laugh of a colleague who had pressed the buzzer in an adjoining room. But soon came the greatest wonder of all. As they began cleaning up the muddle left four years before by the evacuating party one of them idly pressed an electric light switch on the wall. The light came on. Not brilliantly, certainly, but the filaments in the ceiling globe broke into a healthy glow.

While Poulter's rehabilitation party was getting down to work Byrd found himself faced with another problem. The expedition's surgeon developed a condition of blood pressure which made it impossible for him to stay in the Antarctic. He had to be sent back to New Zealand with the supply ship, but the danger of having a large party of men marooned for over a year without skilled medical attention was one that Byrd dared not face. Accordingly he contacted the Royal Geographical Society by wireless and asked for help.

As a result the British ship *Discovery II*, at that time refitting in New Zealand, arranged to bring a doctor as far as the northern edge of the pack-ice, where Byrd's ship *Bear* could meet her.

"My relief to put it mildly was tremendous," recalled Byrd. "This generous act was typical of British sportsmanship. I owe all concerned an enduring debt of gratitude."

Thus it was that Dr. Potaka joined the expedition, of which he soon proved himself one of the best and most uncomplaining members. As early as March, Byrd had cause to be thankful for his presence when Pelter, one of the party, was suddenly taken ill with acute appendicitis.

Dr. Potaka successfully carried out the operation on one of the hut tables. As the temperature was 20 degrees below zero, the hut had first to be overheated as far as possible, and then the fire cleared and the glowing ashes carried out. This was imperative because of the explosive ether fumes that would fill the room.

Potaka thereafter had to work fast to complete the operation, sew the wound and get his patient safely tucked up again in bed before the room temperature fell.

Pelter recovered completely and was able to take his full part in the operations in the following spring. Long before then, however, Byrd wrote this vivid paragraph about the reborn little city he had founded on the ice:

"A city which could boast of electric light and power, a complete broadcasting and field communications plant, a well equipped aviation service . . . a first-class meteorological station, a scientific staff and laboratory equipped to delve into twenty-two branches of science, a dairy plant with four head of cattle . . . adequate medical facilities . . . a library, a meteor observatory, even a motion picture theatre that was wired for sound."

After the *Bear* and the *Ruppert* had finally sailed northwards all but one of the fifty-six-strong expedition there spent the long Polar night of the winter.

The fifty-sixth man wintered alone. That man was Byrd himself, who voluntarily undertook a lonely and terrible vigil unique in the history of scientific adventure.

The strongest characteristic of any man who can organise on the grand scale is an inborn knowledge of men. Byrd showed that he had it in his earliest expeditions. By the time he had built Little America on the Ross Barrier, long experience had developed a natural instinct into unerring judgment.

His main reason for erecting so many buildings, well dispersed from each other was to prevent the men of his team "living in each other's pockets". Although, of course, the principle spread the risk of fire or blizzard damage, it was this instinct which brought him to one of the most important decisions of his life after he had returned to Little America in 1934.

"The result [of Polar meteorology] had been meagre. Antarctica had been under scientific investigation for less than half a century, but so far as weather data was concerned the bulk of the knowledge was represented by the work of perhaps half a dozen well found expeditions. For a continent having an estimated area of four million five hundred thousand square miles this was not much of a showing. Or so it seemed to me. . . . Meteorologically the interior of Antarctica was a blank. No fixed stations had ever been advanced inland; no winter observation had ever been made beyond the coast; and the fragmentary data collected by sledging parties covered only the comparatively mild summer months. Yet inland, beyond the moderating influence of the seas which surround the continent was the coldest cold on the face of the earth . . . it was there that I proposed to plant an advance base. There where weather is manufactured . . . Why should civilisation continue to tolerate a situation that allows ruinous storms, kindled long before at remote storm centres, to break without adequate warning upon the civilised parts of the world?"

Byrd's idea was to set up a weather observation base 400 or 500 miles inland in the region of the Queen Maud Mountains. Winter observations of weather conditions from such a point could not only be tabulated, but radioed daily to the Little America base at the coast for purposes of comparing temperature, wind strength and direction, and so forth.

In actual fact, owing to the immense difficulties of moving tons of supplies over dangerous, crevasse-ridden terrain, the base was sited only just over 100 miles inland. Even so, the comparative data which was thus provided for analysis proved in the outcome to be of immense value.

Very roughly speaking, the world's weather is believed to be controlled by conditions at the Poles. From the icy wastes at each of the earth's axes a cold current of air flows towards the equator. In doing so it becomes heated, rises and returns to the Pole above the cold drift.

This in a far more complicated form is expressed in the Bjerknes theory, which offers an explanation of global weather by the reaction of vast currents of warm equatorial air with the frigid masses which meteorologists call the Polar front.

Even with the modern advances of science virtually little is known of such a gigantic subject, but there is no doubt whatever that even if the two Poles do not actually manufacture the weather conditions of the world, they have an immense influence upon it.

Long before the 1934 expedition Byrd had said: "It's not getting to the Pole that counts. It's what you learn of scientific value on the way—plus the fact that you get there and back without being killed."

While the difficulties of establishing the advance base at latitude 80 degrees 08 minutes South were being overcome, Byrd faced a private problem and made his decision. At first he had planned that three should man the base throughout the seven months of the Antarctic winter. They would have to be men of tough mental fibre, for two reasons. First, because of the super intense cold in the area, which was known to fall to 70 degrees below and more. Secondly, because the sun never rises during the Antarctic winter; the long months would be months of continuous night in which they could expect no relief from the Little America base if anything went wrong. Neither by aeroplane nor by sledge would it be practically possible to reach them until the spring brought light and easier temperatures.

Four Citroen tractors and the big Cletrac took a portable hut and stores to the advance base in the middle of March, but conditions were appalling and the Cletrac broke down and was abandoned. This meant the loss of nearly half the carrying power of the venture, and by the time a square pit had been dug in the snow, and the hut built within it, Byrd realised that it would be possible only to leave sufficient stores for two men to cover the whole period.

His instinctive knowledge of men—even the best and bravest of men—set him dead against this.

"Three is a classic number. Three men balance each other like the legs of a tripod . . . in the nature of human relations one man would constantly be present in the stabilising role of a neutral judge, a court of appeal. Instead of hearing one voice everlastingly and seeing one face and being confronted with one pattern of habits and idiosyncrasies, a man would have two aspects and personalities constantly facing him. Under such conditions it doesn't take two men long to find each other out . . . Not deliberately, not maliciously. But the time comes when . . . the way each man blows out a pressure lamp or drops his boots on the floor, or eats his food becomes a rasping annoyance to the other. And this could happen between the best of friends. Men who have lived in the Canadian bush know well what happens to trappers paired off in this way. . . . In a Polar camp little things like that have the power to drive even disciplined men to the edge of insanity."

In face of this difficulty Byrd solved his problem with his usual quiet, balanced logic:

"The truth is that I myself did not dare to go as one of a two-man team. The other man might turn out badly, as indeed might I, in his eyes. Hating or being hated by a man whom you couldn't avoid would be a degrading experience leaving the mark of Cain in the heart. Feeling as strongly as I did, I certainly couldn't very well ask two other men to do what I wouldn't risk myself. It had to be one man, and that one myself, if for no other reason than that here again I could not bring myself to ask a subordinate to take the job."

It was a bold decision in more ways than one. Byrd was the responsible commander and leader of an expedition of 100 men, four aeroplanes and two ships. Yet, because every one of those men had been hand picked and he knew their worth; because he had unquestioning confidence in every one of his officers, Byrd felt justified in being out of physical touch with them for months on end. Of his second-in-command, Dr. Poulter, the senior scientist whom he left in charge of the main base at Little America, he wrote:

"He is a physical giant of a man. Though attuned to the quiet of the university campus he had the practical judgement and intellectual balance which are indispensible for the leadership of men . . . Poulter would have under him a hard bitten crew who were well able to take care of themselves."

Added to this there was the fact that although Byrd would be beyond physical contact—indeed beyond hope of rescue or relief—he would be in daily touch with his men by radio. He would be able to hear their voices by radio telephone—although he could only send his own communications, reports or orders back to them by the tapping of a morse-code key.

As was usual with Byrd's followers, not one of them questioned his decision. In their own hearts each of them knew well enough the risks he was taking and the grim strain that the loneliness of his self-imposed task would bring. Every man set to work with a will to help him, for time was running out. The winter darkness was coming down with its fiercely-dropping temperatures by the time the advance base hut was completed.

At last the final tractor party gathered up its gear. There were general handshakes, and the machine pitched and rocked its grumbling way out of sight across the vast icy plain of snow to the north.

Byrd was left alone. "I watched . . . until the receding specks had dropped for good behind a rise in the barrier . . . in the Southern sky, opposite the waning sun, the night already settled over the Pole was pushing forth a bulging shadow, blue-black and threatening as a storm sky . . ."

Feeling the sting of frost-bite on his face, he went down into his hut, which, buried in the snow, was approached by a ladder with a double-acting trap-door at the top. In that moment he had the first warning of trouble to come.

"As I slid down the ladder I was sure of something which gave me a bad turn; and that was that in helping the tractor men stow the sledges I had fallen and wrenched my shoulder. The right one was hurting like the devil."

Before that injury was righted Byrd was destined to come closer to a lonely and terrible death than any other explorer who has lived to tell the tale.

In the comfortable, civilised world he had left behind him Byrd was bitterly criticised for the step he had taken. All kinds of rumours were circulating, some of which gave him intense amusement when he heard about them later. One account held that he had actually been deposed from the leadership of the expedition by his own men, who had "sent him to Coventry" in his frozen outpost; another, passing from mouth-to-mouth in the deepest "confidence" that always characterises such rumours, was that he was a life-long alcoholic, and had gone there to give himself up to a winter's hard drinking.

However, serious and practical objections began coming into the Little America base after the information had been wirelessed home that he had established himself alone at the distant outpost. By more than one responsible authority Byrd was warned that if a disaster happened he would be disgraced. He was begged to give up the whole idea and return while it was possible to cross the icy wastes—with the persuasion that he would lose less by reputation in giving the idea up than in persisting and coming to disaster through recklessness and pig-headedness.

However, his loyal comrades at Little America passed none of these messages over to him. They, of all people, knew the real reason for his courageous decision and the real value of the scientific information which could—and in fact did—arise from it. Meanwhile, they wanted nothing to worry him unnecessarily in the six solitary months that he would have to endure before weather conditions would make it possible for a party to go out to his relief in October.

They already knew the truth, as he was to set it down later:

"Advance base was no reckless whim. It was the outcome of four years of planning . . . the farmer whose livelihood comes from crops, the people whose stomachs are kept full by these crops, the speculators who gamble in them, the industrialists whose factories depend upon the farmers' purchasing-power, the sailor on the seas—all these and others, even to the casual holiday tourist, have a vital stake in weather. But few of them appreciate the extent to which the Poles enter into their local scheme."

Moreover, his own comrades remembered Byrd's last words to the men of the establishing party before they left him in the wilderness. He insisted—he gave hard-and-fast orders—that no party was to set out to try to rescue him if wireless communication should fail. Byrd knew more clearly than any other man on earth that any kind of rescue bid in the middle of the Polar night would mean almost certain loss of life among the rescue party. Whatever happened he would not put any of his men to such a risk.

His last words had been: "I don't know much about radio. The chances are that I shall lose communication for short periods, maybe for good. Don't let that worry you. . . . I give you a hard-and-fast order not to come for me until a month after the sun returns. . . . I don't want any act of mine to put you in jeopardy during the winter darkness."

At the base of the hut which was sunk to roof level in the snow-pit there was a narrow "verandah" on the west side. From each end of this verandah the establishing party had dug two deep, narrow ditches each about 35 feet long, running parallel. Into one of the ditches all the cases of food, tinned goods, etc., were dumped and ranged against the sides with an efficient if primitive toilet at the furthest end. Into the other the drums of fuel were lowered, together with a portable petrol-driven electric generating-set to power the radio transmitter. This was a fifty-watt self-excited oscillator with a standard superheterodyne receiver. There was also an emergency radio-set consisting of two ten-watt transmitters, the generators of which had to be hand cranked; also a couple of battery-receivers each of which would run for about 100 hours. The transmitting and receiving apparatus was arranged inside the hut itself. The petrol motor-generator was housed in the fuel ditch in order that its fumes would not fill the hut while it was running.

Before leaving, the party had covered over the two long ditches with supports upon which they piled snow blocks. This turned the ditches into sound, permanent tunnels which Byrd could visit from the hut without venturing up above.

In the hut itself was a mechanism of revolving drums and pens which would record from hour to hour the speed and direction of the wind, registered by a revolving wind-vane anemometer firmly anchored in the snow above. There was also an outside box, called "the beehive", containing thermometers calibrated to read down to 85 degrees below zero, a barograph and a hygrometer. Both the anemometer pole and the "beehive" were set close by the hatch over the hut ladder, so that Byrd would have to move no more than a step or so when he went up to check the readings. This he had to do twice every day at eight o'clock morning and evening in order to record outside conditions as well as those inside the hut, which were electrically traced. These readings and his own personal observations and reports were the most important part, indeed the whole mainspring of the idea, behind his lonely vigil. And these tasks were carried out even at a time when he was so seriously ill that he was convinced death would come within a matter of hours.

For heating, the hut was provided with an ordinary coal-burning stove with two lids which had been converted to burn a kerosene type of fuel. The stove flue was in the form of a pipe that went straight up, took a sharp turn across the room and then another turn up and through the roof. The idea of the long pipe was to increase the area of heating. However, some of the pipe's sections had been lost during the journey from Little America, and its length had been made up by empty petrol tins cut and fitted into position. Ventilation of the hut was provided by an entirely separate pipe system.

All had seemed safe and in good working order when the erection party left. Byrd himself had tested the hut by living in it for a month at the Little America base before it was taken apart and shifted to the advance base. In the early days of his vigil he was conscious that the oily smell from the stove was worse than had been the case at the previous site. He put this down to the fact that, in his complete isolation, such a small thing as a normal oil-stove smell would naturally assume large proportions, and he dismissed the matter from his mind.

In actual fact, deadly fumes were constantly escaping from the roughly-fitted joints of the flue pipes, and in the months to come those fumes were to bring him to within a finger-snap of death.

Byrd made his first radio contact with the Little America base on Easter Sunday. He was delighted to hear the voices of his distant comrades through the radio telephone. Although never very good at the morse code, he managed to tap out that all was well with him, together with a short weather report. The temperature outside the hut was 25 degrees below zero which, as will be understood from following records, he was able to describe as a "warmish day".

Finally, just before signing off, he was informed cheerfully that the radio officer at Little America rated his morse sending as definitely minus.

Equally cheerfully Byrd replied: "Yes, but I am the finest radio operator south of latitude 80 degrees!"

Although his strained shoulder was still giving him trouble—which he certainly did not report to base—the radio contact and news that the last returning party had reached home safely brought his spirits up. In his diary he recorded:

"For the first time after months of struggle and anxiety Little America is at last buttoned up for the winter, and so am I. If we both obey our common sense nothing untoward need happen. . . . I must confess feeling a tremendous exhilaration."

Next day his blithe spirit was brought to a grim test. The outside barometer fell to a recording of 27·82 inches, and a hurricane raged throughout the following night. When at last it had eased, Byrd put on his heavy furs and went up the ladder to go out and make his instrument reading. He found the hatch solidly jammed. In spite of the pain from his damaged shoulder he wrenched and tore at the handle, pushing and pulling alternately in both directions. For the hatch-cover had been specially made so that if it became covered by too heavy a fall of snow for a man to push it up, it was supposed to be released and opened downwards.

For a few moments while lying exhausted at the bottom of the ladder the thought beat into his mind that he was caught. Really caught. Helplessly trapped in a sunken cave beneath tons of snow in the coldest and loneliest part of the earth, with no one to help him.

At last, by using his good arm and driving at the hatch with a baulk of timber for about twenty minutes, he managed to lever it open a crack. Finally he got it a sufficient distance apart to wriggle through—and then he realised that the special two-way hinge-movement offered no extra safety at all. Hard ice had solidified under the snow all round the edges and clamped it tight against movement either way.

Since his strained shoulder was even worse and might render his arm useless at any time, Byrd decided to cut himself an escape tunnel from the food-store. From then on, by working an hour or so a day, he dug another 35-foot tunnel at a different angle, at the far end of which he scraped up to within about a foot of the snow surface. With this he knew he was safe because owing to the violent winds of the area, falling snow does not accumulate to any great extent, but is blown away. Therefore at any time that the hatch was jammed again he had only to go down his escape tunnel, break through a foot of hardened snow, and he would be clear. Meanwhile, the temperature steadily fell until it had reached 65 degrees below zero. Although later on Byrd was to experience a record low reading of 75, his observation of the effects of cold at this point is interesting.

When he lit his oil stove the air in the fuel tank above it expanded so violently that it forced the oil out in a spray. In the course of a day, when the falling temperature reached minus 72, the thermograph in the shelter was stopped by frozen oil. The pens stopped writing, even though the ink had a glycerine base. When he went out the air was so cold that he scarcely could breathe. Only by keeping his glove over his mouth could he draw air in because the temperature constricted his breathing passages. Meanwhile, he found his kerosene fuel actually congealing. The battery in his flash-light torch would not function—the filament would not even glow. Articles of rubber lost their elasticity and broke sharply instead of bending. All the oil in the instruments was solid, and to get them to work at all he had to lubricate them with pure petrol.

The novocaine in his emergency medical supply froze solid and shattered its containing tubes. To touch any metal object with the bare hand was to lose the skin from the fingertips immediately, as though the material had been red hot. Outside, in a slight wind, he could hear his breath actually freezing as it left his mouth, "making a sound like that of Chinese crackers".

In addition to this he discovered, of necessity, the worst of all the tasks with which he was faced. The electrical contact-points in the anemometer mechanism on top of its pole were put out of action by a hard coating of frost. From then on, day after day, he had to climb the pole, often in gale conditions, to clean the points so that the machine would work and provide the right records. His own description of this, for all its restraint, is very vivid.

"It was a bitter job . . . with my legs twined around the slender pole, my arms flung over the cleats . . . trying to scrape the contact points clean with a knife . . . I qualified for the world's coldest flag-pole sitter."

In normal conditions Byrd knew he could weather all this and, indeed, worse. He had not decided to face an Antarctic winter deep inland on the road to the Pole without expecting cold such as he, who had been to both of the Poles, had never experienced before.

The enemy which was to defeat him stood in the centre of the hut: the stove, with its perpetually leaking fumes. When, after a succession of headaches and feelings of nausea, he realised the danger in which he stood, he found himself in a quandary. Without the heat of the stove he could not live; but with the life-giving heat came the fumes which meant inevitable death.

The only remedy was to leave the stove unlit for as long periods as he found physically possible—in short, the one way of preserving his life was to see just how much cold he could endure before that life was frozen out of him.

Before this problem became actually acute, however, he had a terrifying experience which would have been sufficient to break the nerve of a lesser man. On a fine evening when the wind had dropped and the stars were brilliant in the vast Antarctic sky, he went for a walk. Exercise in the open air was already part of his defence against the stove fumes. As he struck out away from the poles and pipes which were all that showed on the surface of his lonely home, he carefully marked his tracks with flagged bamboo poles which he drove into the surface.

When the last bamboo pole had been inserted he went no further —as he thought—but walked in a closed circle. Then, since a certain amount of drift started to come along on the wind, he thought it better to return. He therefore turned round to take the line back by his flagged trail.

The sticks and the flags were nowhere to be seen.

The pipes of the base hut were lost in the darkness. In any case it was a point which could easily have been passed by a man walking 50 yards away without him ever seeing it if there was any drift in the air. Now, in a terrible moment, Byrd had no idea how far he had walked and in just what direction.

He was utterly alone, without shelter, without food, clothed only in half-frozen furs, and with nothing showing to break the monotony of the vast wilderness of ice and snow for thousands of square miles around.

"On the chance that my footsteps would show up I scanned the barrier surface with a flash-light; but my boots had left no mark on the hard *sastrugi*. It was scary. The first impulse was to run. I quelled that, and soberly took stock of my predicament."

Hard courage, together with presence of mind—a very good mind—saved Byrd inside the next half-hour. First he kicked up a small snow-heap that could be seen from a distance of about one hundred paces and made that his point of reference. Then, taking a line from chosen stars, he walked his hundred paces and looked all around, but could still see no flags. Accordingly, he turned right about and marched back with rearward glances at the stars to be sure of keeping the same course. But now at his hundredth return pace he found he had lost his snow beacon! The temptation to run and cast around was almost overwhelming, but he forced himself to take only a few slow steps, when the beacon showed up again in the light from his flash-lamp.

From then on he followed the same course, walking out and back at different points of the compass. At the end of this he still had no sight of the flags, and had to bite hard on a rising instinct of panic. With immense self-control he started his hundred pace system yet again, but at the hundredth he kicked up another snow beacon and then walked thirty paces more. When he started this he was getting tired, and the cold was penetrating sickeningly.

But just as he made his twenty-ninth step on the first attempt his flash-light suddenly showed a bamboo stick with a flag fluttering, just at the far end of the beam.

With a gasp of thankfulness Byrd grasped the stick, marked the next one in line—and for the first time really allowed himself to hurry.

In his daily work on the surface above the hut, he endured two more hideous mishaps before his secret enemy, the stove, laid him low. On one occasion before he had completed his special escape tunnel the stairway hatch played him a second trick by locking him out. At the end of a day during which a gale-force blizzard had been raging, the anemometer contact points failed and, since he wanted continuous readings of the wind force, Byrd went out to climb the mast and clear them. His description of the conditions up above on the surface are the most vivid that any Antarctic explorer has yet recorded:

"There is something extravagantly insensate about an Antarctic blizzard at night . . . it is more than just wind; it is a solid wall of snow moving at gale force, pounding like surf. . . . In the senseless explosion of sound you are reduced to a crawling thing on the margin of a disintegrating world. You can't see, you can't hear, you can hardly move. The lungs gasp after the air sucked out of them and the brain is shaken."

In such conditions of freezing, thunderous chaos he found, when he crawled back to the hatch, that it had jammed shut and even by putting out all his strength he could not budge it an inch.

"Panic took me then, I must confess. Reason fled. I clawed at the three-foot square of timber like a madman. I beat on it with my fists . . . then I crooked my elbow, put my face down and said over and over again: 'You damn' fool, you damn' fool'. Here for weeks I had been defending myself against the danger of being penned inside the shack; instead I was now locked out."

Once again by pulling himself together, by calling up the immense capacity for self-discipline which had saved him before, he now managed to survive.

Lying flat with the blizzard howling and tearing over his body he thought carefully back over the work he had done outside the shack during the previous few days. This brought him the memory that he had left a shovel stuck upright in the snow after levelling-off drift. Carefully he edged about, searching for it, feeling for it, never daring to let himself get beyond sight of the anemometer pole.

At last, with a sense of having been granted miraculous luck, he actually found it—and by shoving it under the edge of the trap door, and then getting his shoulders beneath it for full leverage, he wrenched the hatch open.

It was at this period of his vigil that, irrespective of mischances and even when weather conditions were easier, Byrd first began to experience almost unbearable hours of depression. The smallest things worried him deeply and the fact of his utter loneliness became a weight on his soul. Not until much later did he realise that these were the early signs of poisoning by the fumes he had constantly been breathing from the leaking stove.

With his capacity for logical thought, he not only forced himself to fight the moods off, but also to take whatever measures he could against them. His daily walk, when weather conditions allowed, was, he thought, one of the best tonics for both mind and body. Certainly this enabled him to breathe the pure, unsullied air, but it was depressing in itself since the sun never rose, and it was monotonous exercise over a very short distance in night conditions.

On one of these grim tramps over the frozen surface he came closer than ever before to a very terrible form of death. Suddenly while walking he realised that he was falling. As he fell he pitched sideways, landed so heavily as to be knocked almost senseless, and lay there for a few moments while his scattered thoughts sorted themselves back into a consciousness of reality.

When it came he realised that he had one leg hanging over the edge of an open crevasse.

Realising the appalling danger, he moved himself inch by inch away from the hole which had broken open under one of his feet, and then, after getting his breath, crawled back gingerly and shone his electric torch light down.

"I could see no bottom. My guess was that the crevasse was at least several hundred feet deep. At the surface it was not more than three feet across; but a little way down it bellied out making a vast cave. The walls changed from blue to an emerald green, the colour of sea ice."

Such crevasses covered over with a hard, but fragile bridge of snow which makes them absolutely undetectable from above, are one of the Antarctic's constant booby traps. Byrd forced himself not to think of what might have been as he picked himself up and trudged to the hut—to return with flag-poles and carefully mark the danger spot and the estimated line of the crevasse and its snow covering.

From that time onward, however, the effects of the stove fumes began to get worse. His fits of almost suicidal despondency were followed by absent-mindedness. This went from a matter of annoyance to one of considerable shock when, one evening, he found himself ladling spoonfuls of food from a saucepan on to a bare table—on to which he had forgotten to put a plate.

Although he longed for the scheduled times when he made radio contact with Little America, at the same time he dreaded them, as he found it more and more difficult to concentrate on sending his own messages in morse code.

One evening, when he was in the middle of a transmission the generator-engine in its place in one of the tunnels started to misfire badly. It was impossible for him either to receive or send with clarity, so he signalled that he was breaking off for repairs. He went to the engine in the tunnel. The place was heavy with exhaust-gas and for a moment he felt giddy as he crouched over the engine to make adjustments.

The next thing he remembered was finding himself flat on the floor of the tunnel with the engine still running unevenly just above the level of his head. Somehow he managed to switch the engine off and crawl to his bunk. He had a splitting headache, his eyes hurt like fire and he was wracked with nausea. In short, he was desperately ill; the long, slow process of fume-poisoning having been topped off by his breathing the exhaust gas from the generator engine.

As he lay in his bunk, too ill with pain to light his stove, he realised that death was close, for the bitter cold was laying an iron hand on everything in the hut around him.

"The fact was manifest that I was helpless. . . . I barely had strength to light the candle standing on the tin ledge directly over my head . . . what chance did I have of bringing in food and fuel from the tunnel? . . . I could live many days without food. I could suck snow to quench my thirst. But ill and weak as I was I could not live long without heat."

He realised from his own symptoms that he was suffering from carbon monoxide poisoning which could not have been brought about just by a few seconds of breathing exhaust fumes from the engine. The constant, sticky, oily smell from the stove plus the fact that the flue-pipe was, to his own knowledge, far from air-tight supplied the full explanation.

"That night as never before I discovered how alone I was . . . my stupidity was to blame . . . the gasoline engine dealt the blow which knocked me down . . . but what reason I could muster indicated the stinking stove as the principal villain."

Next day when he awoke he was frozen almost to the point of death, but at least he knew he had passed several hours in perfectly clean unpoisoned air. He therefore lit the stove and crouched over it.

"The flame burned red and smoky when it should have been blue and clear; and studying it I knew that this was from faulty combustion and was one source of my misfortune. This fire was my enemy, but I could not live without it."

So, as the weeks dragged by, the lonely, dangerously sick man fought a continuous nightmare battle of enduring cold to the furthest possible limit, and then thawing himself in the heat from the stove which he knew was poisoning him further with every minute that it burned. This fight he carried on without saying a word of it when he made radio contact with his friends at Little America. For he knew that if they had a suspicion of what had happened they would send out a rescue party, some members of which would almost inevitably come to disaster by attempting the crossing of that ghastly terrain during the Antarctic winter darkness.

Personally, he had little hope of his own survival, but was determined that, as long as he could survive, he would not be responsible for bringing any of the others to their deaths.

Without Byrd realising it, however, a suspicion that all was not well with him had already arisen at the Little America headquarters. In the first place, there was the abrupt ending to his transmission at the time when the exhaust gas from the generator had knocked him out. At the next transmission he was so weak that the business of getting the engine started took infinitely longer than he imagined, with the result that he was very late in getting through.

When he did so he was almost at the point of collapse, and his morse messages that he was quite O.K., and had been delayed only by a fault in the engine, were unusually badly transmitted. Waves of sickness kept on affecting him and, indeed, for many days he had hardly been able to keep anything on his stomach. Moreover, he was in an ague with the cold, since he was now forcing himself to do without the stove for up to ten hours a day and, at that, he had the hut door propped wide open whenever it was burning.

The question "was he all right" was repeated several times by the radio telephone. Byrd realised that he had not been quite so convincing as he had intended. Therefore, to allay the fears of his comrades, he decided to tell just a little of the truth. He tapped out that the smell from the stove had been getting rather bad and, as a result, he was bilious. He assured Base there was nothing to worry about, but, in order to rid himself of the discomfort, he asked for advice about trimming the stove and lamp burners and the possible use of a different fuel. Finally he forced himself to crack a laboured joke before signing off.

Between then and the next transmission, however, the base party had decided that something had gone far more radically wrong than he admitted. Amongst themselves they agreed that a rescue party must somehow make its way across the 100-odd miles of crevasse-ridden darkness. The difficulty was that it would take some time to organise. It would be impossible to attempt until makeshift searchlights had been fitted to one of the tractors and a preliminary expedition had been made to see whether the trail-marking flags were still standing. Without them as a guide there would be little hope—other than by blind chance—of the party being able to find the buried hut in that vast wilderness of desolation.

The headquarters party knew perfectly well that if they gave any hint that such a rescue attempt was being organised Byrd would forbid it, even with his dying breath. If they flatly disobeyed they knew that, until they could reach him, he would feel such a sense of failure and futility that it might affect his mental balance. Therefore they made their plans with the utmost tact.

At the next radio transmission Dr. Poulter carefully gave Byrd the answers to his questions about the lamps. The doctor warned him to look out for the presence of moisture in the fuel, which would cause the stove or the lamp to give off nauseating fumes. Having done this he began to talk about the scientific work they were carrying out at headquarters, making it all sound normal and as though they were asking for their leader's approval.

Dr. Poulter went into the subject of the observations of meteor showers which the expedition had been carrying out in conjunction with various observatories in other parts of the world. Now, he added, the headquarters party had decided to extend this special operation. They were busy overhauling the tractors with the object of moving out across the barrier to get a better observation of the meteors from further inland. The thing seemed so natural and casual that Byrd, in his semi-dazed state, suspected nothing. He merely tapped back a message of approval, with strict orders that every precaution was to be taken against mishap.

He was still unsuspecting at the next transmission a few days later, when Poulter came on to say that highly successful preliminary runs had been made with the tractors easily following the trail in the direction of advance base. The flags were still standing and easily picked-out in the searchlight beams. He now added that he was especially anxious to push the forward observation out as far as advance base itself, to see a big meteor shower known to be due in August. And he gave the number of the proposed party of observers as five men. The plan was to start any time after July 23rd, at the time of full moon.

To Byrd, ill, frozen, almost at the end of his tether, the words were so welcome that they were almost beyond belief. This meant rescue without failure. This meant a chance of life, of which he had practically despaired, if only he could hold out and endure for another three or four weeks.

In his own words: "It flashed through my mind that if Poulter and Murphy, both men of rare judgment, wanted to make the trip it could not be considered too hazardous at Little America. This is their show not yours, my inner voice said. They want to come here on their own account, and you need have no shame."

Even so, pride would still not allow him to jump at the chance.

"Wait a minute," I tapped out. "I finally told him to make more trial runs and let me know the result. Yet even as I said this I knew deep in my heart that I should never have the will to refuse him . . . not just because I, Richard Byrd, had died as all men must die; but because with me would vanish the ephemeral tension that held 100 men to a single cause—the leadership, the plans and the name which had been able to command credit to pay for the outfitting of ships, tractors, airplanes . . . the name was the asset, not the pain-ridden, bankrupt body which bore it."

As a result of that wonderful news Byrd's spirits soared, although the temperature dropped viciously, reaching 65 degrees below zero on July 1st. Although he had a serious relapse of health in the days that followed, and felt that the end was close, he forced himself to do without heat from the stove for between twelve and fourteen hours a day. Ice was now solid on the inner walls of the hut and creeping from the floor further and further towards the ceiling. The desolate barrier all around was actually shrinking with cold.

"One could almost feel the crustal agony. The snow quakes came with great violence. Sometimes the sound was like thunder with one clap breaking upon the other . . . a few were severe enough to waken me from sound sleep."

Then the worst happened. At the next schedule for radio contact, when he dragged himself to the engine and managed to start it, the generator failed. The shaft had broken and the set was beyond all his hopes of making a repair.

There remained only the emergency set, which had to be worked by hand. The one way that Byrd could now get through to his headquarters was by cranking a generator and at the same time trying to tap out his message on the morse key.

In his deadly-weakened state the double effort was sheer torture. He could only successfully signal: "All O.K., but radio uncertain from now on. Don't be alarmed by missed schedules".

Again he writes: "The temperature was 60 degrees below zero but sweat was pouring down my chest . . . I was in for my third serious relapse and coming on top of five weeks of depleting illness it very nearly did me in."

Next day, July 7th: "Everything—myself included—is saturated with cold. For two solid weeks the thermograph trace has been wandering through the minus forties, fifties and sixties. . . . The ice over the skylight is fanning out to meet the ice on the walls which has risen level with my eyes. . . . I simply must have more warmth even at the expense of less ventilation and more fumes."

All through that terrible month Byrd alternated between semi-consciousness and periods of vague recovery during which he managed to feed himself and make his routine checks of the instruments. One of the most astounding features of the whole of his battle with sickness is that somehow he managed to keep the records, tend the instruments and change the sheets, with hardly a day or so's gap from start to finish.

From time to time he managed to make uncertain radio contact with Little America and finally, at the end of July, heard the news that the so-called meteor observation party had started out.

As a matter of fact Dr. Poulter had started and been beaten back more than once. Now at last he decided upon a do-or-die effort. With Demas, the tractor expert, and Waite, the radio operator, he set forth in a temperature of 64 degrees below, but was beaten yet again after only twenty-six miles by mechanical trouble.

On August 8th, with the tractor repaired, the three started out again, and this time managed to keep going. Eventually Poulter signalled Little America that he had made ninety-three miles south, keeping to the flagged trail. The headquarters operator managed to contact Byrd and tell him the news. Byrd put out his greatest effort and was able to drag cans of gasolene up the ladder from the hut and out on to the barrier. There, for as long as he could stand the cold, he lit can after can to make a blazing beacon, tumbling down below to warm his frozen bones while they burnt. At last, on August 11th, he saw the far-distant lights of the tractor lurching and rocking over the snow and heard the distant sound of its horn. Then came the supreme moment when the tractor ground up close and the three men dropped down, staggering up to him and grasping him by the hand.

"I stood up, but I did not dare to walk forward. I remember shaking hands all round and Waite insists that I said 'Hullo, fellows. Come on below. I have a bowl of hot soup waiting for you'. If this is really so, then I can only plead that no theatricalism was intended. The truth is that I could find no words to transport outward what was really in my heart. It is also said that I collapsed at the foot of the ladder. I have only a muddled impression of that and a slightly clearer one of trying to hide my weakness."

Byrd's weakness was such that the rescue party had to nurse him gradually back to health for a clear two months before an aeroplane could be flown out to carry him back to Little America. It was typical of him that he said that the period of delay was all to the good, since it enabled them to extend their meteorological recordings that much longer. His own farewell to advance base, as written in his personal record, is also characteristic:

"I did take away something that I had not fully possessed before: appreciation of the sheer beauty and miracle of being alive, and a humbler set of values . . . civilisation has not altered my ideas. I live more simply now, and with more peace."

For many weeks after his return to Little America, Byrd was still dogged by a feeling of heavy inertia and lassitude which made any task a matter of supreme effort. However, he said nothing of this to his companions, but forced himself to take up the reins of leadership again and deal with all matters of organisation for the spring operation.

Dr. Potaka was the only one who knew just how sick he really was, but Byrd swore him to silence and flatly disobeyed his advice not to fly. In fact more than a year passed before he had fully recovered and his system was free from the effects of the poisoning.

Meanwhile, the main object of the second expedition had to be achieved, and in that special achievement lay one of the greatest interests of his whole life.

Up to that time there had been a theory that the whole of

Antarctica was divided by a strait. It was thought that the land-mass was traversed by a waterway stretching from the Atlantic to the Pacific Ocean in the area of the South Pole. This waterway naturally would be a strait of ice. Byrd, for many reasons, had never been convinced that it was there at all.

To put the matter to proof or disproof the spring operations were divided among three land parties. One was directed eastward into Marie Byrd Land on a reconnaissance of the Edsel Ford Mountains; another struck out towards to the Queen Maud Range, and a third, supported by tractors, was headed for the plateau. These areas were also to be covered by a carefully worked-out schedule of flights which could put a full breadth of picture around the detailed discoveries and investigations of the men on foot.

Six flights were made deep into the unknown wilderness, and Byrd forced himself to go on the first and the last. The success of these flights was largely made possible by regular wireless reports from the sledging and tractor parties, who were able to provide reports of weather conditions from day to day and, when necessary, from hour to hour. In return the airmen were of enormous help to their earth-bound comrades by flying ahead of them to report areas badly crevassed, and to suggest alternative routes.

Once again the high-pressure organisation, the forethought and the very size of the expedition, with its mass of equipment, proved its worth. The sledging parties, led by Siple and Blackburn, were brilliantly successful in their surveys of the Edsel Ford and the Queen Maud mountain ranges—Blackburn's party reaching to within 200 miles of the South Pole and finding signs that showed gigantic coal deposits. The tractor party under June made a three-weeks trip covering more than 500 miles in weather conditions too bad even for dogs.

As the wireless reports came in, Byrd at Little America was able to accumulate evidence that made the existence of "the great ice strait" more and more unlikely.

Finally, on his last flight, he was able to fit the key piece of jig-saw into the puzzle.

Far out along the 140th meridian, the only remaining area where traces of it might have been found, "the land was still rising. A bulwark in all directions. . . . A solid barrier to the strait. It was land, all land; land over-ridden by ice to be sure; but land, were the ice to melt, would stand as solidly interposed to the questing keel of a ship as the Atlantic coast of America stood before the 16th century navigators seeking a strait to Cathay".

When Byrd landed, the mission of his second expedition was accomplished. He had proved that Antarctica is a single continent, a vast land-mass surrounding the South Pole, with no waterway between the Ross and the Weddell Seas.

Byrd returned to America where his earlier critics hastened to congratulate him. Not that he cared about them in the least. His only concern was to rest and recuperate. Meanwhile, although he believed he had solved one of the greatest problems concerning Antarctica, he still felt that he had but turned the opening pages of an all-absorbing book.

The passion to know yet more brought about his return to the frozen continent in 1939. On this occasion he established a base at Marguerite Bay in addition to his old headquarters at Little America. From these points and from his ships lying off the coast, he and his party carried out a magnificent programme of exploration covering the Walgreen coast and Thurston peninsula together with air reconnaissances of the Bowman coast, the Palmer peninsula and the entire length of George VI sound. In addition, sledging parties explored the Weddell Sea coast and the Fosdick Mountains.

The success of this expedition might well have been expected to satisfy even the greatest of explorers that his career was complete, but Byrd stood apart from the normal run of men. It seemed that the Antarctic was part of his very existence, and to the end of his life he could not bring himself to bid the White Continent a last farewell.

He returned yet again in 1946 with the United States Navy's great Antarctic task force, "Operation High Jump". This expedition operated in three separate groups from vessels lying off-shore, and made a detailed survey of Marie Byrd Land, a great area of the coasts of Wilkes Land and the Bellingshausen Sea. During this venture, the Admiral flew to the Pole for the second time.

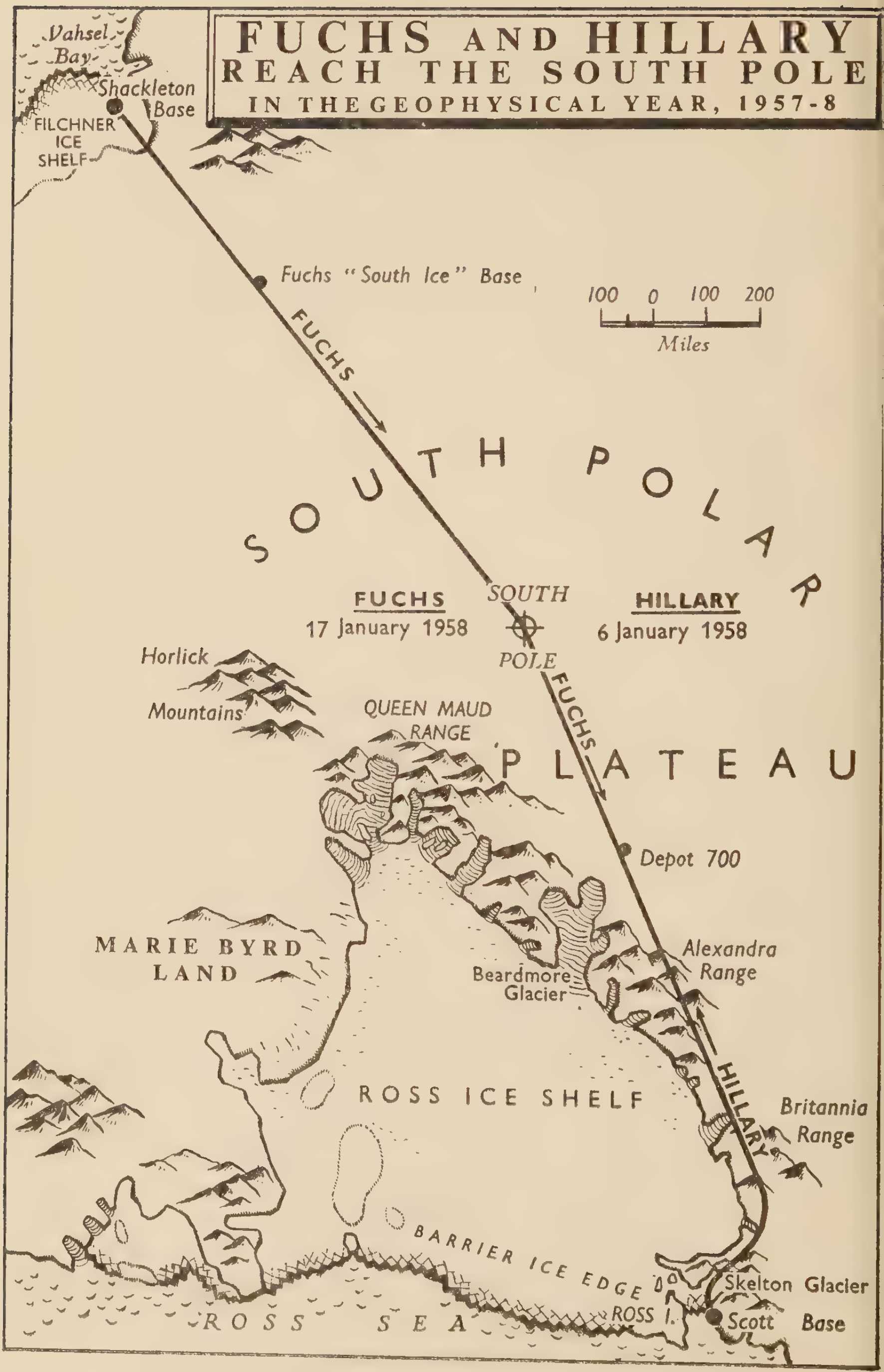
By now, however, even he realised that he had tested himself too far. The action of his heart gave warning symptoms which he was unable to hide from the medical authorities. There was, in fact, no doubt that the effects of the poisoning sustained at Advance Base in 1934 had done irreparable damage.

He was forced to return home to America, but there no one could make him rest, and he gave himself up to the preparation of yet another great scientific venture scheduled for the year 1957.

By the time that expedition was launched, however, his life came to an end. The great heart of one of the greatest explorers the world has ever known ceased to beat. Richard Evelyn Byrd went to join the personal heroes of his own life—Roald Amundsen and Robert Falcon Scott.

Part Five

FUCHS AND HILLARY



FUCHS AND HILLARY REACH THE SOUTH POLE
IN THE GEOPHYSICAL YEAR, 1957-8

CHAPTER I

ADMIRAL BYRD died while launching his country's share in the International Geophysical Year of 1957–8. During this "year"—really eighteen months long—the scientists of sixty-four countries agreed to investigate the same phenomena at precisely the same time and freely to pool their discoveries.

When the "year's" work is done, electronic brains—computing machines which, in the space of seconds, can perform calculations that would take mathematicians months—will work out the results. It is planned that a comprehensive picture will be produced, and in the details of this picture there may well appear discoveries of enormous value to mankind.

It has long been realised that the Polar ice-caps act as water-reservoirs for the world. Countless millions of tons of water form these continents of ice, which slowly calve away at the edges, into the seas, as the pressure of the glaciers is released by the summer thaw. The forming and gradual melting of this Polar ice not only determines the size of the Polar caps, but also controls the rest of the world's glaciers which form about one tenth of the surface of the globe. In fact, it has been calculated that if the Polar caps melted, sea level would be raised by anything up to 200 feet everywhere else on earth. London and all coastal cities would lie further beneath the surface than the present bed of the North Sea.

A balance of natural conditions, however, keeps the oceans and the dry lands as they are—or rather allows noticeable changes to occur only gradually over millions of years. That balance, it is believed, is controlled by a combination of the energy contained in light, heat, cosmic, ultra-violet and X-rays which are radiated to the earth's surface in every passing second by the sun. If the earth received too much of this radiation, every living organism upon it would die. If it received too little, the same thing would happen.

The continuity of life on this earth lies on one side of a pair of scales balanced on a fine edge. What lies on the other side is represented by the hundred miles or so of atmosphere which covers the earth and allows only just enough of the radiations to reach us.

In its effects on the forming and melting of the Polar ice-caps—the evaporation and condensation of the air—the sun's radiation controls atmospheric movement. This means all the storms, the blizzards, the hurricanes which, in their turn, affect the tides and movements of the oceans.

It becomes obvious, therefore, that the cauldrons in which the world's weather is made lie at the Poles. This is one reason for the present investigations at the ice-caps; yet there is another which is even more important. It concerns the fact that some of the sun's radiations are influenced by the magnetic fields of the earth—which, like those of any other magnet, are strongest at its poles.

At the Polar areas, therefore, the most rewarding investigations are likely to be made.

Finally the "sun-spots", or flares, observed on the limb of the sun are known to coincide with increased bursts of radiation. These have been found to wax and wane roughly in an eleven-year cycle, and it is at the peak of one of these cycles that the present International Geophysical Year has been arranged.

There are new factors which make Polar exploration far more important to mankind than Scott, Shackleton or any of the earlier adventurers even dreamed.

First, there is the new development of the "atomic" furnace. Owing to the enormous quantity of heat such furnaces can generate per pound of fuel, in comparison with coal or oil, there may well be a future for them where ice perpetually covers land.

Now dawns the possibility that men will be able to mine the rich mineral deposits which are known to lie locked in the Antarctic wastes. Moreover, in an economically chaotic world where some areas suffer starvation, while others are in a state of glut, the Antarctic represents the means of providing a balance. Food stored by international agreement in such a gigantic, natural refrigerator might be available for distribution to distressed areas.

The world "international", however, brings up possibilities which are not so beneficent. The threat of war seems always to be with us, and Antarctica has already become a military factor. In the last war German raiders captured the entire Norwegian whaling fleet in sub-Antarctic waters, made the area a headquarters for operations, and proceeded to sink and capture hundreds of thousands of tons of Allied shipping. From that base they also mined the harbour approaches to the main Australian ports. Should war break out again, and if both Suez and Panama were wiped out by atomic missiles, the routes round the Cape of Good Hope and Cape Horn would become vital.

Cape Horn may be dominated in the military sense by any air force based on Grahamland in Antarctica. Who holds this land controls the Horn passage, which lies only 500-odd miles away. But Grahamland, British by original discovery, is claimed both by the Argentine and Chile, who have refused to accept the arbitration of The Hague Court of International Justice on the matter. Argentina, moreover, insists that she "inherited" the land by reason of a Papal Bull issued in 1493, in which the Pope granted Spain all land on earth west of a line running from Pole to Pole.

However absurd such a claim may be, the nations concerned and those which may dominate them are deadly serious. It is more than possible that in Antarctica the world may yet again find itself faced with another "Powder-barrel of Danzig". The only sanity seems to lie in the United States' suggestion that the whole of the area be henceforth administered by the United Nations.

These are the undercurrents to the work now in hand, and especially to the successful transcontinental expedition of Hillary and Fuchs which—by the age-old right of discovery—gave the British Commonwealth a moral claim to entirely new lands.

CHAPTER II

I HAVE mentioned Sir Edmund Hillary first because the ordinary people of any country on this earth would recognise his picture. Also because he is the sort of man who couldn't help becoming an international figure if he had merely beaten a record at flagpole squatting.

By contrast Dr. Vivian Fuchs[1] only recently became known to the world in general, even though he led important expeditions in

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[1] Dr. Fuchs has now received the accolade of knighthood. The title of "Doctor" is kept throughout this narrative as it was the one he bore during his historic journey.

Africa and in Antarctica before he accomplished the great feat in which Sir Ernest Shackleton failed—the crossing of the Antarctic continent.

Fuchs dislikes publicity and is supremely happy in receiving far less of it than Hillary—who, it must be added in justice, has honestly never sought it. No two men could be more unalike in appearance, temperament, background and personality.

Hillary is very tall, immensely strong, quite fearless and unquenchably cheerful. Born in July 1919 of a New Zealand family in normal, modest circumstances, he went to Auckland Grammar School and then took up the business of bee-keeping—in which he is still in partnership with a brother.

During a school holiday, scrambling in one of the New Zealand ranges, he was bitten so badly by the mountaineering bug that climbing became the supreme interest of his life. Later, after having become recognised as one of the most promising of the young Commonwealth mountaineers, he volunteered for, and was accepted by, the British Everest Reconnaissance Expedition in 1951. In the course of this his outstanding work won him a place in the final assault party under Sir John Hunt in 1953—and the whole world knows the rest of the story. Much less generally known is that Hillary served in the Royal New Zealand Air Force during the war as a navigator on Catalina flying boats on operations across the Pacific.

Sir Edmund Hillary, K.B.E., is one of the least-spoiled men who ever achieved world fame. He shows now no outward and visible difference from the tousle-headed, companionable Ed Hillary who, in obscurity, scrambled the peaks of his homeland ten years ago. He has no scientific or academic attainments, makes no pretensions thereto—but he understands mountains and how to live and work in shrivelling cold. Further, out of lifelong experience, he can lead and direct others with a sure touch.

Happily married, prosperous, dedicated to lifelong battle with ice, winds and weather, Hillary is an outstanding example of a man thoroughly contented with his lot. He doesn't regard himself as the world's greatest mountaineer because he happened to climb the world's greatest mountain. He does not seem to think much about himself at all—unless it be to consider himself lucky because there are so many more enticing mountains in various parts of the world, and he is still young enough to climb a great many of them.

He has a genuine and ready respect for all whose learning and mental attainments are beyond his own. Such a man is Vivian Ernest Fuchs, M.A., Ph.D., already a holder of the Polar Medal and the Founders Gold Medal of the Royal Geographical Society.

Although not of Hillary's height, Dr. Fuchs stands over six feet and has a magnificent physique. Born in February 1908, he went to Brighton College and St. John's, Cambridge, where he attained his doctorate as a geologist. Although a born intellectual, he showed early in life not only a love of adventure, but all the stamina and fortitude that life in the wild places of the world demands.

When Vivian Fuchs was twenty-one he joined the Cambridge East Greenland Expedition, and a year later went with the University Expedition to the East African lakes. In 1933 and 1937 he led the Lake Rudolf Rift Valley and the Lake Rukwa Expeditions.

After war service with the Cambridgeshire Regiment in West Africa and North-west Europe—in which he was mentioned in dispatches—he was demobilised with the rank of Major in 1946.

A year later he became leader of the Falkland Islands Dependencies Survey on the fringe of the Antarctic Circle. Quiet in manner, soft spoken and with all the restraint that so often goes with mental and physical strength, Vivian Fuchs is best described in the words of one of his own followers:

"You never seem conscious of him giving an order. I don't quite know why. Possibly because he has already made sure you know what has to be done. And I suppose you wouldn't be there, anyway, if he thought you'd make a mess of it." Which, in itself, is as comprehensive a description of a born leader as one could wish to hear.

Dr. Fuchs is happily married with two children. He infinitely prefers the appreciation of those who understand his aims and those scientifically equipped to assess them, to the glamour of world fame.

On the other hand, he had sufficient worldliness to realise the value of publicity to an expedition which had a financial gap to bridge. He therefore accorded interviews and gave Press Conferences. At such times he is distinctly amusing to watch. In spite of a quiet charm which comes naturally, he cannot help showing his dislike of being glamourised, his carefully-restrained astonishment at some of the questions he is asked; his even more restrained assessment of some of the questioners. One is reminded of a well-bred lion giving polite attention to a deputation of domestic mice.

Shackleton, Dr. Fuchs holds—with many others—to be the greatest of all Antarctic leaders. In following Shackleton's vision and in giving it reality, he has fulfilled a life-long ambition. Neither he nor Hillary would, however, allow their own achievements to be considered on level terms with those of Shackleton, Scott, or Amundsen.

The earlier leaders had only dogs or ponies to help them and their teams over the wastes. Once they left civilisation they were out of touch with the world. Once they left their ships or bases on the ice-fringe they were beyond any hope of calling for help. They knew themselves to be on a continent the size of Asia in which at any time there were less than fifty living men. They had no means of knowing the characteristics of a yard of the treacherous surface that lay before them. Everything they did and every step they took was into the unknown in all senses of the word. If they died in their tracks like Scott and his party, months had to pass before searchers could go to look for their frozen bodies.

Fuchs and Hillary had efficient radio communication with their bases, with each other, and with the outside world throughout the whole of their attempt. Both parties had aircraft which could and did survey the wastes ahead of their track, gave warning of crevasses, found alternative ways around difficult areas. Both parties were well equipped with motor tractors for the heavy work of supply-hauling and depot-laying as well as for the final advances. Moreover, they also took invaluable dog-teams for the actual work of proving the surface ahead. Both parties knew that, in a case of dire emergency, they could make radio calls which would result in aerial and vehicular rescue attempts by American, Russian, French—in fact half a dozen or more nationalities—who had well-equipped stations and made up a population of over 1,000 men in the field.

Dr. Fuchs and his advance party sailed from London on November 14th, 1955, bound for Vahsel Bay on the south coast of the Weddell Sea. Their ship was the 839 ton *Theron*, a 1,310-h.p. motor-vessel built in Glasgow in 1950 for work amid the ice of the Canadian Arctic. Her crew were sealers under the command of Captain Harald Marø of Nova Scotia.

The stout little vessel was heavily laden, her cargo overflowing on to her decks, where enormous crates containing a $2\frac{1}{2}$-ton SnoCat tractor, an Auster aircraft and hundreds of drums of fuel were surmounted by yet another Auster aircraft fitted with floats. Twenty-four husky dogs were accommodated on the fore-deck in specially built kennels fitted with canvas covers and blinds to protect them both from the Antarctic seas and the tropical heat through which they would have to pass on their way.

Twenty-six days later, when the ship refuelled at Montevideo, Sir Edmund Hillary and J. H. Miller joined her, having crossed from New Zealand, together with the chief of the flying section of their party, Squadron Leader J. Claydon. As had already been planned, they joined the advance party so that they could get first-hand experience in the matter of unloading stores on to the ice, erecting huts in Antarctic conditions, and taking off and landing aircraft on snow and ice surfaces. This experience gave them a basis upon which to organise the training of their own party during the following year after they had returned to New Zealand.

The ship had made her final call for refuelling at South Georgia, where the Auster float plane, serviced by Flight Sergeant Peter Weston, was test flown by Squadron Leader John Lewis and Flight Lieutenant Gordon Haslop of the Royal Air Force.

Theron, by Boxing Day, was in pack ice, and a repetition of Shackleton's failure seemed grimly likely, even though there was no comparison between the strength of the two ships.

After a thirty-three-day battle with the pack, however, she was able to make southwards again for the Caird coast. There a call was made at Halley Bay, where Surgeon Lieutenant-Commander David Dalgliesh and ten men were building the Royal Society's Geophysical Year base.

Since Dr. Fuchs' advance party was late, and the precious days of the Antarctic summer were running out, he took off in the Auster with Squadron Leader John Lewis to see if there was a possible route to the Pole from this point. The terrain, however, proved impossible for a ground expedition, since the land southwards was crossed by glaciers and scarred by crevasses. Further flights by Ken Blaiklock with Lewis and Haslop confirmed this in spite of constant difficulty with low cloud and ground mist.

There was no alternative, therefore, but to keep to the original plan. *Theron* once again headed south for Vahsel Bay. As she passed the position 76 degrees 32 minutes South, 31 degrees 30 minutes West amid a mass of broken and calving icebergs, the party knew that they were at the spot where Shackleton's ill-fated ship had sunk after being crushed in the pack.

The ship was conned through to Vahsel Bay next day, after which the R.A.F. pilots took the leaders, flying low, searching for a base which would give a clear run for a ground party marching south to the Pole.

The best point was chosen, ceremonially named "Shackleton Base", and *Theron* was moved 25 miles to anchor at the nearest coastal point, a 12-foot-high shelf of ice. On January 30th unloading began, together with the back-breaking work of bridging and filling crevasses, so that a safe route could be made for the tractors to haul stores from the ship's side to the base itself.

The R.A.F. party fitted skis to their aircraft, cleared an 800-yard runway near the ship and began assembling their oil and fuel dumps. Whenever the weather allowed, they were in the air. Blaiklock, who had been appointed leader of the advance party, was constantly flying, trying to find a possible way past a mass of crevasses that had been observed earlier to the southward.

Meanwhile, the unloading party toiled solidly from 8 a.m. to midnight in almost constant southerly winds, which in that area are the coldest of all. A sudden change which brought a howling blizzard from the north on February 1st produced fresh difficulties. Heavy seas broke over the ice landing-stage. Stores were swamped, and the party had to toil frantically, up to their knees in almost freezing water, to get their perishable stores further inland.

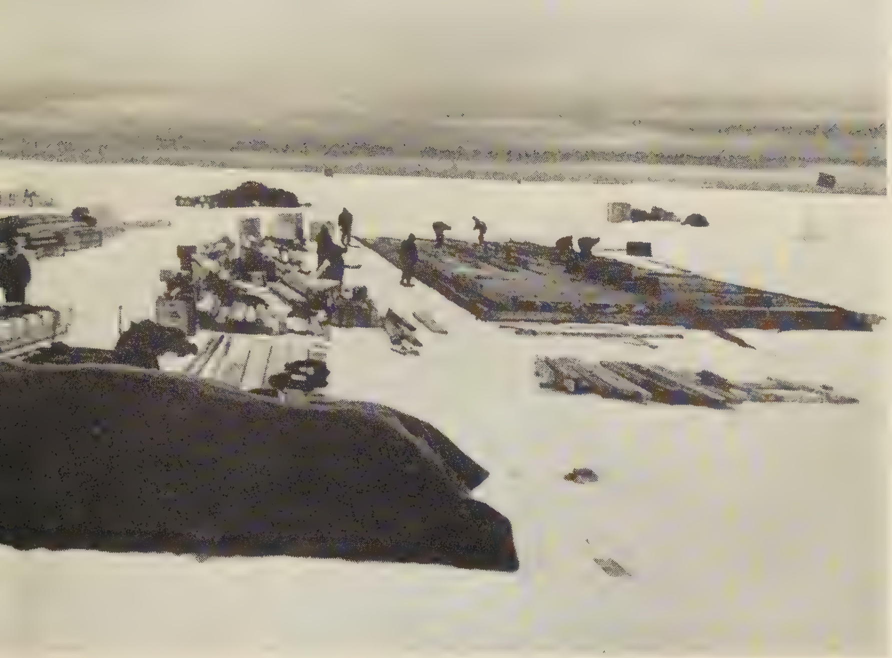
Theron was in danger, bumping and grinding as the seas forced her heavily against the ice edge, when suddenly the worst happened. A great mass of ice driven by the blizzard surged out of the murk and crashed into her, tearing her from her stern ice anchors. A moment later her forward cables parted, and she wallowed away and disappeared in the driving snow.

The position of the shore party was now grim. They had no shelter—no huts and no tents. They were all soaking wet in a temperature well below freezing. They had no means of getting dry, much less of getting warm. Masses of ice were grinding past the position where *Theron* had been lying.

They did the only thing possible—they went on slopping about, reclaiming stores, loading and heaving them away to safety—hoping, without much conviction, for the best. At least the work kept their blood circulating.

Captain Marø, however, skilfully turned *Theron* and, taking advantage of every opening, came back within reach of the shore party less than half an hour after she had first broken loose.

Ropes were flung over and orders bellowed for every man to



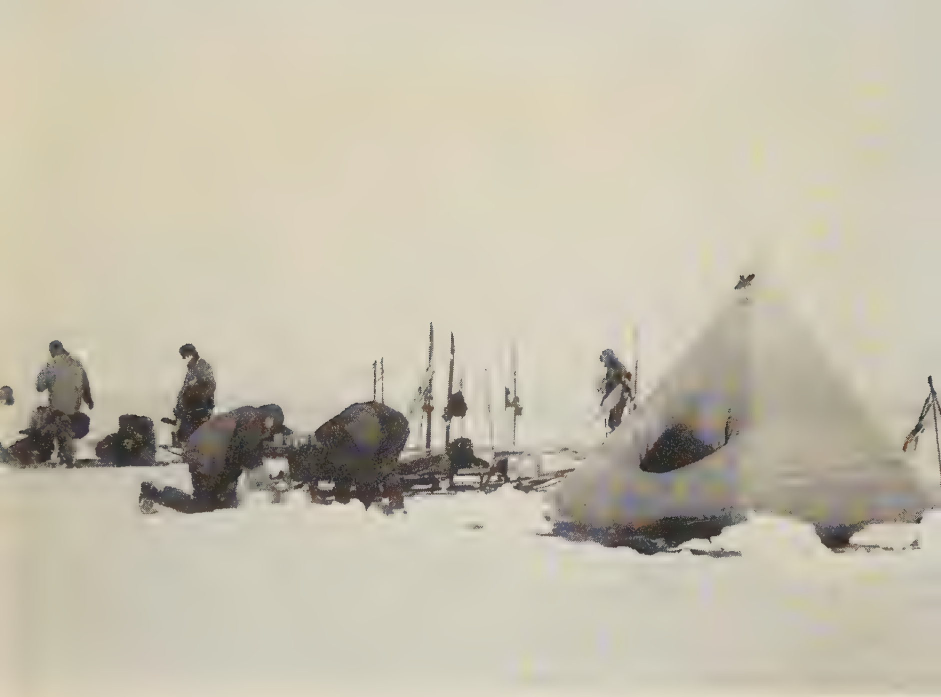
Above: Working on the foundations of the 130-foot hut at Coats Land, base of the 1956 Expedition's advance party.

Below: The *Theron* passing tabular icebergs in the Weddell Sea.

THE FACE OF

Above: Pressure ridges of the ice-crack from the Barne Glacier to Inaccessible.

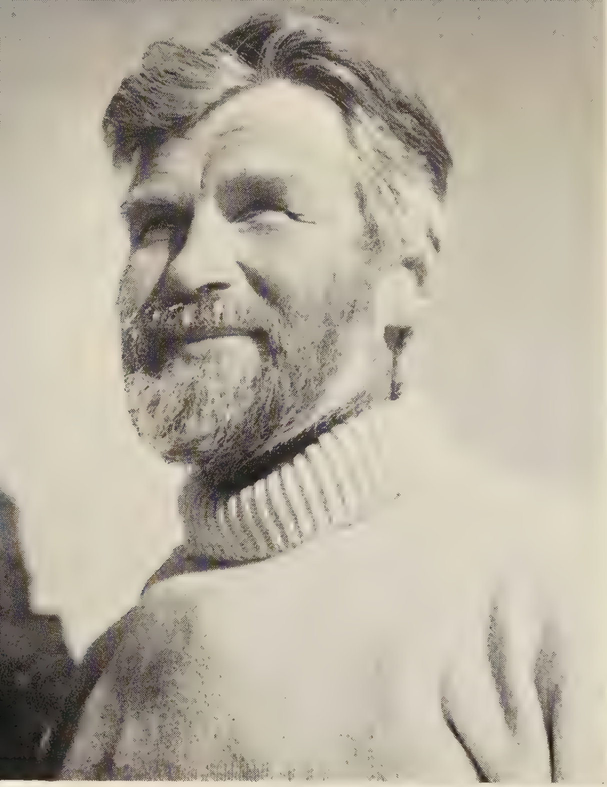
Below: Adelie penguins relax in soft snow at foot of a glacier.



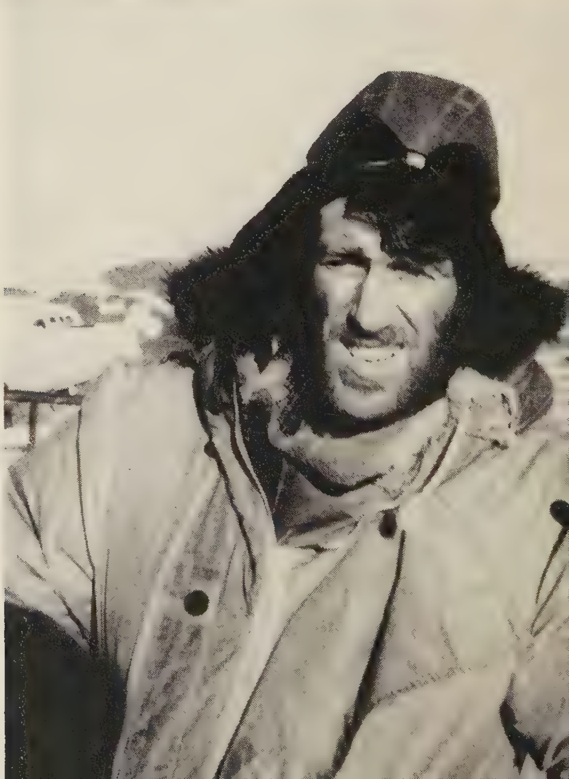
ANTARCTICA

Above: Scott's Expedition camp on King Edward VII Plateau at 87° S.

Below: Seals basking on pancake ice.



Fuchs at the South Pole.



Hillary at Scott Base.

drop anything he was doing and scramble aboard. Then *Theron* once again put to sea so that the men could dry themselves and get a hot meal.

This still meant leaving five who had been working up at Shackleton Base itself. Dr. Fuchs, however, was not worried about them because they had plenty of food and the means of building themselves shelter. They would be safe, if necessary, for several days. As it happened, the wind changed again, and by next afternoon the grinding ice-pack had been blown away from the anchorage so that *Theron* was able to return and the whole party could restart work.

On February 5th Captain Marø warned Dr. Fuchs that there was danger of the ship being frozen in for the winter. Although the advance party had practically all their material ashore, some hundreds of tons of it were still lying at the landing-place, since it had not been humanly possible to get it all hauled up to Shackleton. John Lewis flew the Captain off to make sure that there was still open water through which escape could be made to the north.

Since it had not yet been possible to get a hut erected at Shackleton, a big SnoCat packing-case had to be used as a temporary shelter. It was close enough confinement for the eight men remaining for the winter, but they stoutly held that it would serve their purpose until they could get the permanent main hut built from prefabricated parts which were on the site.

On February 9th Marø returned to announce that he dare not wait any longer. Ice was increasing over the only observed course by which he could get the ship out. Fuchs, Hillary and all who were not staying with the advance party therefore went aboard.

Waving from the ice landing-stage, on which a mass of stores was still piled were Ken Blaiklock, the leader, R. A. Lenton, the second-in-command; meteorologists R. H. A. Stewart, J. La Grange and P. J. Jefferies; R. Homard the engineer; E. Williams the wireless operator, and the Medical Officer, Dr. R. Goldsmith.

Fuchs knew that they were being left with a much heavier mass of work to perform than had been planned. However, there was no way out of it. They had plenty of food, plenty of fuel and a first-class medical officer. Given ordinary luck they should have no worries, even though a year must pass before he could return with the main party.

Luck, however, is just one factor which never runs normally in Antarctic conditions. Six weeks after *Theron* left, a blizzard from the north came howling down upon the Shackleton anchorage. On the ice-landing there were still tons of stores which the winter party had not yet been able to haul up to the base. These were counted to be safe on thick ice steadily getting thicker with the rapidly falling winter temperatures.

The blizzard shattered the ice landing-stage and all the mass of stores were lost. The total coal supply went, together with the prefabricated parts of a wooden workshop—a tractor—much of the liquid fuel and all the chemicals needed for making hydrogen for the radio-sonde balloons.

Incidentally, the Polar wind-force was shown by the fact that a metal lattice wireless-mast which had been blown down was found some days later—just over two miles from its original position.

Captain Marø got *Theron* away only just in time. Within a couple of miles she was at a dead stop in pack-ice, but managed in the next twelve hours to weave a way through to clear water.

The Captain became almost a legendary figure to the men of the expedition. They delight in one story concerning his resource. In forcing his way through an ice-field he realised that *Theron*'s rudder had become bent, because the ship refused to answer directly to her port helm. He therefore calmly put the ship into reverse, charged backwards into a floe with the rudder at what he judged to be the right angle, and thus bent it back almost into its true shape again.

After a call at Halley Bay the ship reached London on March 23rd, 1956. Hillary and his companions returned to New Zealand, where during the following year they trained their own party in the almost Antarctic conditions of the Tasman Glacier under Mount Cook. Dr. Fuchs was plunged into the intricate detail work of fully organising his main party, getting together stores and equipment and supervising a mass of modifications to tractors and general gear in the light of actual experience.

Meanwhile, the winter party under Blaiklock at Shackleton Base were getting on with their heavy programme of work in spite of their appalling loss of stores. Although there was no coal, and paraffin was extremely limited, one of them was still cheerful enough to say that after all there was less to be humped up to the site!

Their living conditions were grim indeed. The packing-case was their only solid shelter through the winter while they were laying the foundations of the main hut. Since it had to house the wireless equipment and the kitchen, and serve as a drying place for wet clothes, it was impossible to use it as a dormitory. The eight men, who were veritably rubbing shoulders when eating, working indoors or resting, had to go out to sleep in tents at night in temperatures of anything down to the minus 60's. As preparation for bed, therefore, they had to dress themselves in their furs, gloves and boots.

In spite of the strain on tempers imposed by such overcrowding and discomfort, the party worked well together. They hollowed snow tunnels in which to house the dogs through the long winter. They kept constant meteorological records religiously taken at intervals of three hours by day and night.

When Dr. Fuchs arrived back with the main party a year later, the amount of work done by Ken Blaiklock and his men astounded him. The main hut was built, the generators and wireless equipment installed—this in spite of blizzards averaging seven days a month with winds of up to 50 or even 100 miles an hour. With the return of the sun in late August the dogs had been brought out, disciplined and trained. Long sledge journeys had been accomplished, on one of which Blaiklock with Goldsmith surveyed 50 miles of the route towards the Pole. On another they went further, and made the valuable discovery that the badly crevassed area which had earlier been observed from the air could be got round without deviating far from the planned course. Finally they prospected the foothills of the mountain range which was known to lie 150 miles to the south. This, of course, provided the first solid stepping-stone to the transcontinental journey.

Dr. Fuchs, John Lewis, George Lowe and Donald Milner arrived at Shackleton on January 12th, having flown from Halley Bay, where their ship, *Magga Dan*, had anchored. This was a good deal bigger than *Theron* and carried a party joining the Royal Society's International Geophysical Year base at Halley Bay.

There Lewis, Haslop and Flight Sergeant Weston of the original R.A.F. party had assembled the de Havilland Otter aircraft in which Lewis piloted Dr. Fuchs and the others to Shackleton Base 250 miles further south. The *Magga Dan*, of course, followed later to unload the men and stores of the main expedition at the original *Theron* anchorage.

Additions to the main party now included Dr. Alan Rogers of Bristol University, Dr. Hal Lister and Jon Stephenson, geologist and glaciologist. Geoffrey Pratt, a geo-physicist, had the special task of seismic sounding of ice-depths and investigations into Antarctic gravity. David Pratt, engineer, came in charge of the SnoCat tractors he had been testing in the Norwegian mountains, and had already made a number of ingenious modifications upon them.

Soon after, the sun began sinking towards its final farewell for the winter months. All flying and sledging had to cease, and the men of the Weddell Sea party carried out final snugging-down. All, however, were cheered by the fact that Hillary had already established his "Scott" base at McMurdo Sound, 1,200 miles away on the far side of the ice-continent, and the two leaders were in weekly contact with each other by radio.

Hillary's party was eighteen strong, equipped with sixty husky dogs, two Weasel tractors and five light Ferguson farm tractors. Two Britishers were among their number: Dr. George Marsh, an expert in handling dogs, and Lieutenant Richard Brooke the surveyor. Dr. Marsh with Brooke, Ayres and Ellis took three dog-teams to survey the Ferrar glacier on the opposite side of McMurdo Sound. This had been marked as a possible route by which the ground party could reach the Polar Plateau and eventually meet Dr. Fuchs' party after they had passed the Pole.

The route, however, proved to be impossible. The glacier was found to be deeply hatched with crevasses and at its upper level there was not even a clear space on which an aircraft might land.

Following a suggestion by geologist, Gunn, the Skelton inlet further to the south was prospected in the Beaver by Hillary, Claydon and Brooke, and a depot established on the plateau at the top of the glacier. Another depot on the Polar Plateau 175 miles inland at a height of 8,000 feet was established after which, with the winter coming, all men were withdrawn. Scott Base, like that of the main party on the other side of the continent, was snugged down and prepared for the winter months of storm and darkness.

CHAPTER III

In following the British Commonwealth teams in their marches across Antarctica there is a point of comparison which is worth noting at the start. The American expedition established a base at the South Geographical Pole by flying in all their personnel and gear. This base they kept supplied by air from their bases at Little America on the Bay of Whales and at McMurdo Sound.

A modest estimate of the total cost is above £8,000,000.

Fuchs and Hillary had only £500,000 to spend between them—to cover all costs of transport, gear, food-supplies, tractors, dogs and four reconnaissance aircraft. They went the hard way; every foot of it on the frozen, treacherous surface.

I make the comparison in no way to belittle the American achievement, which was a magnificent example of planning, organisation and individual hardihood on the part of all concerned.

During February 1957 Dr. Fuchs' advance base at South Ice, 270 miles inland on the route to the Pole from Shackleton Base, was built up by air-lift. Squadron Leader John H. Lewis, Flight Lieutenant Gordon Haslop, Flight Sergeant P. B. Weston and Sergeant E. Williams of the R.A.F. by their combined effort moved in 19 tons of stores in an equal number of flights by the Otter.

South Ice was established at a point 4,850 feet above sea level at 81 degrees 56 minutes South. When completed it was equipped with all necessary scientific apparatus and an electricity supply from both petrol and wind-driven generators. There Ken Blaiklock, Hal Lister and Australian-born Jon Stephenson settled down to spend the long dark months of winter.

On the other side of the continent, at Cape Evans, Hillary was in winter quarters with his deputy-leader, J. H. Miller, Murray Ellis, John Claydon and Bill Cranfield (pilots), Guy Warren, Murray Douglas, Bernie Gunn, George Marsh, Harry Ayres and Roy Carlyon.

Apart from religiously keeping scientific records, and copious experimental ice-boring by Fuchs' party, nothing could be done towards surveying the Polar routes from either side until spring.

In September, however, both bases were once again alive with activity. Dogs could be brought out from winter quarters and exercised and re-trained to their duties. Marching gear, sledges and vehicles, carefully overhauled during the long winter months, were tested. Aircraft were serviced and flown, and reconnaissances re-started.

Early in October both Fuchs and Hillary began breaking trail for the first stages of the great adventure. With SnoCat and Weasel tractors, dogs and sledges, Fuchs and a party established a ground-route to South Ice. From there Fuchs was picked up by air and flown back to Shackleton to superintend the trans-continental party's full-scale start.

On that journey, however, he had his first real experience of the appalling difficulties that lay ahead. The party had had to cross heavily crevassed areas in which, time after time, the snow collapsed under vehicles and left them perched precariously over yawning depths. The work of linking-up others to haul them to safety—the constant toiling forward to probe and flag possible safe routes—took up precious time. It was impossible for the patrolling Otter aircraft crew to give warning of such invisible death-traps.

Fuchs had started as early as he dared in the short summer season, yet he was behind planned schedule by mid-November, although he and every man with him had worked themselves to the limit. By that time the Auster aircraft had logged forty and the Otter eighty-seven hours of flight.

Hillary, meanwhile, was having all the luck despite a 90-mile-an-hour blizzard which struck on the 14th February, the day he started out. Although established at a point only 15 miles from Scott's old base, he followed a route planned along a very different track from that taken by Scott.

As will be seen from the map, he was not starting directly south across the Ross Ice barrier. He was making for the Skelton Glacier, which lies to the right-hand side of the Barrier ice-sheet. (Since compass-points at the South Pole, where "everything points north", are confusing to the layman, I think it better to refer to the map on page 144 and write of "left" and "right".)

As will be seen, the Skelton Glacier offers a path up on to the solid land rising to the right of the Barrier ice-sheet. Hillary's route lay on this high ground running south towards the Pole behind the mountainous fringe of the land-mass. When speaking of "land" it is perhaps unnecessary to add that it was earth covered with unknown depths of ice and snow, with only mountain peaks showing above the white wilderness.

The distance from Hillary's base to the foot of the Skelton Glacier was 180 miles. Then there came 90 miles of tortuous route up the glacier ice to the plateau at a height of 8,000 feet where "Depot 280" was pitched. Roughly 200 miles further on was his projected "Depot 480". Far beyond the horizon, at a point about 500 miles from the South Pole, lay his planned meeting-place with Dr. Fuchs—"Depot 700".

By November 26th, after a grim journey over heavily crevassed areas, Hillary's party reached Depot 480. Although the weather had been against them, and for long periods radio-communication had been blanked-out by blizzards, they were in good fettle and their confidence was high. This was especially so by reason of the behaviour of their Ferguson tractors. These little machines, only slightly modified from the type one may see at any time in an English field, had hauled their loads through the sub-zero temperatures of deep snow and crevassed areas with untiring efficiency. Moreover, they continued to do so when Hillary decided to press on to the Pole itself.

When Hillary arrived at Depot 480, Fuchs, on the other side of the continent, had only been on his trans-continental march for two days. With every sympathy and understanding concerning the delays which had bedevilled Dr. Fuchs, it is fair to remember the above dates in judging Hillary's later actions.

Dr. Fuchs' party which started on 24th November was made up of David Stratton (deputy-Leader), Ken Blaiklock (surveyor), David Pratt (engineer), Geoffrey Pratt (seismologist), Hal Lister (glaciologist), Jon Stephenson (geologist), George Lowe (photographer), Roy Homard (engineer), Ralph Lenton (Carpenter and Radio Operator), Johannes La Grange (meteorologist) and Dr. Alan Rogers (Medical Officer and physiologist).

The four members of the R.A.F. party, while carrying out reconnaissance work to help the main party on its way, were to remain based upon Shackleton. Only when the pioneers were far enough on their journey were they to evacuate the base and fly the single-engined Otter aircraft clear across the continent to Scott Base. This feat, after one failure due to icing was carried out as a matter of routine, yet, although overshadowed by the publicity attending the surface expeditions, it ranks as one of the major achievements in the history of Polar aviation.

The first point to emphasise about Fuchs' party is that they were dedicated to scientific observation and recording; this was the one motive, in Fuchs' view, which made the effort and the risk to life worth-while. The work was carried out in detail in spite of its delay-effects on the course of the journey—which was already behind time.

Hillary's party, on the contrary, had no such work to hamper their speed, apart from the normal observations any well-equipped expedition would make as a matter of course. Their job was to survey and mark the route from Scott Base, leaving supplies at the appointed places to the final cache at Depot 700. Just that and no more. At Depot 700, according to the agreed plan, they would meet the Fuchs party after it had crossed the continent via the Pole; after which, Hillary and his men would work as guides, leading the whole contingent back to Scott Base along the route they had surveyed and provided with depots.

Hillary and his men carried out their task to the full. Nothing they undertook to do was left undone. The best routes were sought out and carefully flagged and charted. Every depot was pitched precisely where it should have been by accurate navigational "fix". If there was any fault—and if it can be called a fault—they completed a first-class job too quickly. By the time Hillary had cut his tractor-ignition at the point of Depot 700 he had known for some time that, if he were to wait there for Fuchs, he and his men would have to stay a matter of weeks.

If the lives of Fuchs' party had been put to any danger by their moving from that spot, there is no question but that Hillary and his men would have stayed put. This can be said as a plain fact without any flights of heroics.

The equally plain fact remains that, by staying in a bleak depot on the icy heights of the Polar Plateau, they could not help Fuchs in the very least. Hillary therefore decided to push ahead to the American base at the Pole. Whether or not he did this with Fuchs' knowledge and permission has not been made clear at the time of writing.

In this there is little on which he can be criticised by those of experience and common sense. His later actions, however, were not only tactless but showed an amazing lack of understanding of another man's feelings.

Fuchs and his men at that time were still lurching in their SnoCats and Weasels across the first 70 miles of crevasses on the route to South Ice. Although they were a fortnight late in an all-too-short summer season, their scientific work was as rigidly attended to as was the drudgery of hauling out vehicles which went through collapsed snow bridges.

If ever a leader was hag-ridden by nervous tension, it was Fuchs. The crashes and shocks of breaking through snow into the crevasse mouths had murderous effects on the vehicles. There was every chance that tracks, gears, driving-shafts and any other overloaded parts would fracture at any moment. On one occasion, when a big SnoCat was trapped, canted over at a perilous angle, the party had to labour for hours. First, hard snow had to be packed into the crevasse over which it hung. Then men crawled down under the vehicle itself, and gradually built up a bridge out of metal parts to support its tracks—until by other linked vehicles it could be dragged to safety.

While this grinding work was going on in raging blizzards and dazzling Antarctic "white-outs" the scientists at regular intervals made borings through the ice to take "cores". To the informed observer these show strata—like rock strata—which not only tell the conditions of Antarctic weather over past years, but also contain clues to the early history of the continent.

This is of immense interest, especially as it is linked with the great coal deposits known to lie under the gigantic ice-cap. Wherever there is coal there was, millions of years ago, woodland and thickly-growing vegetation. As far as Antarctica is concerned, this can mean one of two things; either the present Polar area was once tropical, or the crust of the earth has shifted with the passing aenons, moving a tropical land from the heat of the sun to shrivel and die in sub-zero temperatures.

It may well be that Fuchs' scientific team will bring back records that go far in solving the mystery. At intervals of 15 miles throughout the journey they measured the gravitational strength which gives a strong clue to the formation of the earth beneath the ice. This detective work was carried further by seismological tests every thirty miles. In these tests an explosive charge buried beneath the surface is fired, sending shock waves down through the ice and through the earth-formation probably a mile beneath. Waves are reflected back to the surface from the boundary layers of the differing rock strata. The results can be read-off on recording instruments which indicate the composition of the varying strata.

Gradually, as this work was carried out, the party fought onward to South Ice, re-stowed and re-loaded the vehicles, and set out across the waste for the Pole, itself. They had by then crossed what they believed to be the worst of the terrain, but after slogging up a gigantic ice slope on to the Polar plain they were again in great difficulties.

Here they were among *nunataks*—the ragged pinnacles of mountains almost entirely submerged in snow. Driving a tortuous course through these added heavily to the distance covered. Then they found themselves facing a sweeping area of hard-packed snow-ridges known as *sastrugi*. These gave the tracked vehicles as hard a pounding as the crevasses. The effect was that of crossing an enormously magnified ploughed field where each furrow was up to 4 feet high and frozen solid. The field, stretching to unknown limits, had to be crossed, since there was no possible way round.

Pitching and crashing constantly, straining sledge-towing linkage to the very limit, the tracked vehicles lurched on and on. Speed of movement came down calamitously to snail-movement in weather that grew steadily worse.

On December 19th, Fuchs was still nearly 600 miles from the Pole, two clear weeks behind schedule. Hillary's party at Depot 700 had left in their wake a big job thoroughly well done. That they had not hurried over any task is shown by the fact that they stayed ten days at Depot 480, from where Hillary organised by radio the reinforcing and extra-stocking of earlier depots by air.

They then pushed on steadily, carrying to Depot 700 the full planned load of supplies down to the last detail.

Hillary's arrival was far in advance of the best that had been hoped for. As has been said, he had been able to make a start at the end of the second week in October, which was early, having regard to Antarctic weather conditions which could normally be expected at that part of the season.

In deciding to push on for the Pole with his party he knew that the Americans, at their almost luxurious base, would fly him and his men back to Scott Base, where their own aircraft would be available to carry Hillary to Depot 700 again when Fuchs had reached within striking distance.

On December 23rd London received Hillary's signal "Am Heading South". Five days later, on the 27th, he was reported to be only 290 miles from the Pole and going steadily, although in "soft snow like sugar". On that day, too, the Prime Minister of New Zealand said, "If it is with Dr. Fuchs' agreement, it is a splendid thing."

That one remark disposed of rumours which had become current that "pressure had been put on Hillary by the New Zealand Government to race Fuchs to the Pole".

The New Zealand authorities then and at all other times recognised Dr. Fuchs as the overall leader and agreed without question to his decisions.

In short, when Hillary and his four companions arrived on Friday, January 3rd, 1958, and signalled cheerfully "Have hit the Pole bang on", the whole world accepted the fact as a high achievement and rejoiced in their good luck. This was especially pointed by the fact that Hillary had certainly cut things fine. He arrived with only one drum of petrol left—just enough to have run the tractors for about another 20 miles.

On that same day, before Dr. Fuchs heard of Hillary's arrival, he signalled his own position as at 84 degrees 43 minutes south, or about 350 miles from the Pole. And, he added: "This is no race. Hillary and I are of the same expedition and we have work to do en route."

At this point, if Hillary had been content with adding the Pole to his Everest achievement, and carried on quietly to fulfil his part of the agreed trans-Antarctic schedule, no serious criticism could have been levelled against him.

As it was, however, he decided upon a course of action which astounded experienced Polar explorers wherever they were in the world.

He made a public statement to the effect that it would be dangerous for Dr. Fuchs to continue the march from the Pole to McMurdo Sound, having regard to the lateness of the season and the blizzard conditions which could be expected. He applied to the expedition authorities and asked that Fuchs should be advised to abandon the march when he reached the Pole, allow his party to be flown out by the Americans, and return to complete the march in the following year.

That there was risk in continuing the march by Dr. Fuchs cannot be denied but, when carefully reviewed by expert authorities, it was judged to be no greater a risk than must be accepted by any who are prepared to face Antarctic conditions. Much was made by the Press in general about the fact that the weather had beaten poor Scott and his men, who had started their grim trek back from the Pole at practically the same period of the year.

There was, however, no such comparison to be made. Scott and his men were exhausted before they even turned back. They were ridden with scurvy, badly frost-bitten, half-starved. When they reached their depots they found that most of their fuel had evaporated. Moreover, they had the ghastly task of facing their ordeal as beaten men—all their efforts had gone for nothing because they had been forestalled by the Norwegians.

By comparison Fuchs and his party, although they had endured a tremendously hard march, were all thoroughly fit and well-fed. They had mechanical vehicles. This meant that the speed of their march in the worst circumstances would be far greater than Scott's best. Even if their vehicles broke down one by one and had to be abandoned, they would still be far better equipped for marching than Scott's party. The depots Hillary had provided were citadels of strength compared with those of the party of 1912.

Moreover, they were men emboldened by the spirit of success. However hard the going—however they might have to bed-down in tents and endure blizzard conditions for perhaps days on end, high achievement still beckoned them on.

The expedition authorities in London reviewed the whole position with the New Zealand Committee, and agreed without question that Dr. Fuchs should not be deterred from pressing on.

There seems to be no doubt that Hillary had been over-influenced by his anxiety to get his base party at McMurdo Sound away from the Antarctic continent before the winter freezing of the sea made it impossible for their ship to leave.

Such an event would, of course, have meant them spending another winter of ice and darkness. But it can hardly be considered as a good and sufficient reason for abandoning one of the greatest explorational attempts in history while there was still every normal chance that the whole march could be achieved without loss of life.

Certainly Fuchs and his men might only complete the journey so late that another winter on the continent would be inevitable. This they were fully prepared to face—indeed, it was a price they gladly accepted as payment for final and full achievement.

The great trans-continental march, therefore, continued. Dr. Fuchs' reaction was to tell Hillary bluntly that he was going on and did not feel that he could bother him to return to Depot 700 as planned. He said that he and his men would find their way out from there to Scott Base without calling upon Hillary's local knowledge.

In justice to Hillary it was at this point that he showed the real decency of his character. He swallowed the snub and bowed to the decision of the authorities.

He announced that he would forget the whole unfortunate mistake, and do everything in his power to help Fuchs complete the crossing that season.

Moreover, he was the first man to stride forward and offer his hand to Fuchs when he reached the Pole on January 20th, 1958. The greeting between them was warm, there were dozens of American cameras clicking, and there was a force of reporters from the International Press.

If there was still a coolness between leader and deputy that did not thaw for some time, the thing is understandable. . . .

In any case, Dr. Fuchs made a public re-acceptance of Hillary's help as from Depot 700. While he and his party thankfully accepted forty-eight hours of American hospitality, Hillary flew back to McMurdo Sound. So it was that Dr. Fuchs eventually led his men out from the American Polar base, heading north, on January 22nd—just four days later than Captain Scott had started the same journey in 1912.

Looking back to that grim event, one cannot help comparing the scene that had greeted Fuchs and Hillary with that experienced by Scott. It seems impossible that Scott could have visualised the excellently equipped base with its hot showers and warm messrooms—even less the attendant party of reporters from the world's newspapers.

His own words ring in the mind: "Great God! this is an awful place . . . now for the run home and a desperate struggle. I wonder if we can do it."

In the outcome the luck that doomed Scott favoured Fuchs from that moment onward.

CHAPTER IV

In the first week the trans-continental party averaged 35 miles a day, so that by the end of January they had covered a spanking 280 miles. Although Dr. Fuchs had hoped for such a high average, the wiseacres shook their heads and prophesied that it would not last. The men might stand the strain, but not the worn and battered

SnoCat tractors. By February 3rd the party was reported to have covered 400 miles and was only stopped for "vehicle maintenance". The pessimists pointed out that the next hundred miles from the party's given position to Depot 700 included one of the worst crevasse-areas of the whole route. Moreover, the weather was now turning foul, which was to be expected so late in the season.

At this point came the news that Hillary had got half his Scott Base party away, homeward-bound to New Zealand, on board the American freighter *Grenville Victory*. There was a rumour, afterwards justified, that one of Fuchs' men was suffering from exhaust-gas poisoning. Later, oxygen supplies were flown up and dropped near the party because the aircraft could not make a landing.

This suggested that the men were in really bad trouble. If battered exhaust-pipes were leaking on one vehicle, they would probably soon start leaking on others. If more men were stricken with the resultant gas-poisoning, Fuchs might be stranded on the icy plateau with sick men on his hands and no hope of help from the air. Moreover, if aircraft could not land, and winter was coming apace with its blizzards and ultra-sub-zero temperatures, what chance was there of Hillary fulfilling his promise and flying to Depot 700 to act as expert guide?

In short, Dr. Fuchs was getting a bad Press—even from papers who had reporters at Scott Base. But at the expedition's London headquarters, where there were men who talked from practical experience, confidence was blandly unshaken. In fact, as the party were reported to be on the move again and reaching to within 30 miles of Depot 700, the official view at headquarters was that Fuchs could not fail.

This certainly seemed over-optimistic when news came next day that the party had gone off course. Two SnoCats had lurched into crevasse-mouths, with the result that the steering-plate of one was broken. Fuchs signalled, however, that both vehicles had been hauled out and that the broken part could be repaired in a few hours.

By that time the party were indeed so used to dealing with crevassed vehicles and had worked out such an efficient technique of recovery that such mishaps were a matter of course. Fuchs was as good as his word, and on Friday February 7th he arrived at Depot 700 with two SnoCats, while the other two followed at an interval of about 10 miles.

While the damaged steering was being more solidly repaired and a general maintenance check carried out, Fuchs contacted Hillary, who was still held up at Scott Base in a driving blizzard that made flying impossible. It was agreed that the party should push on with their journey directly all was in order, whether or not Hillary could get through to join them. It would indeed be tempting fortune to delay an hour longer than was necessary, so late in the season.

The weather at Scott Base, however, improved on the Sunday, and Hillary was able to get through and join the party that evening. Next morning, February 10th, with Dr. Fuchs he led the way out from Depot 700 as the party started the final, main stage of their 2,100-mile trans-continental journey.

Almost immediately they were in crevasse country again and, in spite of Hillary's personal knowledge of the trail, the speed of progress naturally fell sharply. A certain anxiety began to be felt because not a word was heard from them for the next three days. This was caused by a radio blackout. When Fuchs finally re-established contact with Scott Base he reported that they were approaching the Midway Staging Depot, just over 100 miles from Depot 700.

Here further vehicle repairs held them up, but in any case progress would have been stopped by a "white-out", a condition caused by myriads of tiny ice crystals which fill the air and so obliterate vision that a man cannot see the surface beneath his own feet. As such conditions can often last for days on end, and since the speed of progress had dropped heavily, it seemed that fortune was really turning against the party.

Although they were in no danger—as the word has meaning to Antarctic venturers—their chances seemed to be nil of covering the 595 miles to Scott Base in time to get away before the pack froze completely.

Repairs were a problem. In a temperature that dropped to minus 38 degrees, metal needed a full two hours of heating for welding and, once the weld was made, another hour of controlled cooling was necessary. Nevertheless, the party moved directly it was possible and surprised even the most confident of their well-wishers by driving in to Depot 480 on the evening of the 17th of the month.

Although the weather worsened, neither Fuchs nor any man with him was willing now to ease-up or accept any delay that could possibly be avoided. They were making up time again, and, as they ploughed on, Hillary's clear knowledge of the trail he had discovered and surveyed was proving of immense help. In three days they covered over 80 miles despite snowstorm and semi-white-out conditions. By the 21st they had reached to within 400 miles of Scott Base.

Although a blizzard broke, they made a spectacular dash, and on Sunday 23rd signalled the wonderful news of their arrival at the Plateau Depot, only 280 route miles from the end of their journey. Now the position was altered indeed. Even the pessimists had grudgingly to agree that not only was there a chance of their reaching Scott Base before the pack froze, but every hope that they might complete the trip in somewhere near the 100 days that Dr. Fuchs had originally scheduled. They had only to make the descent of the Skelton Glacier by a route already surveyed and proved by Hillary to reach the surface of the Ross Ice Sheet for a clear run home.

Before reaching the Plateau Depot, Hillary had signalled Base asking for special supplies. These were flown in to the party next morning by S/Ldr. Lewis, R.A.F., and S/Ldr. Claydon, R.N.Z.A.F., in the Otter and Beaver aircraft. They included thirteen pieces of steak, twenty-six fresh eggs, seven tins of powdered cream, seven tins of fruit, together with fresh bread and cold cooked meats.

After a monotonous trail-diet, with its staple of hard, fatty pemmican, this made a royal feast indeed. To add to the general high spirits, the weather improved, and next day the party was on the trail again, entering the Portal, a shallow snow-basin at the head of the Skelton Glacier. Although conditions were clear, a strong wind brought the temperature down to minus 30° F., as the SnoCats started the descent of the Staircases. These are long, gently-sloping ledges, each joined to the one below by banks of hard snow. The passage down over them was tricky work for the SnoCat drivers, but Hillary's earlier journey had already proved the absence of crevasses on the chosen trail.

On Tuesday, February 25th, Fuchs signalled that they had covered 60 miles, with only another 40 to cover in order to reach the Skelton Depot on the edge of the Ross Ice Shelf below. Now he had good surface ahead, since the glacier was not raw ice, but snow-covered, as it led down to the Ice Shelf level.

Hillary's original route from Depot 700 right down to Scott Base had been doubly checked by two other men—Dr. George

Marsh of Shrewsbury (a former Registrar of Luton Hospital), and J. H. Miller, second-in-command of the New Zealand expedition. They had carried out one of the finest sledging journeys in Polar records. The former had joined the New Zealand team as Medical Officer, but already had long experience in handling Huskies, and automatically became chief dog-handler to the expedition. He trained with the New Zealanders on the Tasman Glacier in South Island and then, for a full year, worked with Miller preparing for the great journey they had in mind.

Both spent the long months of winter darkness at Scott Base before Hillary's party were ready to make their start surveying and plotting the trail to Depot 700. They sledged ahead of Hillary and broke several hundred miles of the trail he eventually followed with his Ferguson tractors. Then they went away to the east and covered a great tract of the frozen wastes in the area of the Queen Alexandra Range.

Miller is a qualified surveyor, so that, apart from establishing geographic fixes for four of the trans-Antarctic depots, he was able to map a large area of hitherto unknown territory. This included the 100-mile-long Beardmore Glacier, a slow-moving river of ice which in places is over 20 miles wide, the Nimrod Glacier and Mount Markham.

Between October of 1957 and February 1958, when they drove their dogs back into Scott Base, the two men covered nearly 1,700 miles, by far the greater part of which lay over the frozen 8,000-foot-high Polar Plateau. In the course of their journey back they returned to Depot 700, where they were able to provide guidance for the British Otter and the New Zealand Beaver aircraft which brought in extra fuel supplies. These had been requested by Dr. Fuchs while he was at the South Pole.

Marsh and Miller then followed almost exactly the same course later taken by Fuchs and Hillary from the Depot back to Scott Base. One of the most spectacular parts of their achievement lies in their handling of the dogs, with which, in good snow conditions, they were able to put up daily runs of well over 20 miles.

Meanwhile, as the trans-Antarctic party were approaching Depot 480, unexpected events at McMurdo Sound brought about the possibility that they might not be able to get their heavy vehicles into Scott Base at all. In the middle of February the floating ice-shelf suddenly began breaking up owing to tidal pressures in the Ross Sea.

This faced the Americans at their nearby McMurdo Base with a major problem. Great sections of the ice-shelf broke away and were carried out to sea. A United States Air Force Globemaster aircraft with a loaded weight of 90 tons, and costing over £1,000,000, was forced to cancel a supply trip to the American base at the South Pole because the ice runway—the only one on which it could land in Antarctica—began to break up.

This meant an earlier evacuation than had been expected for many of the American McMurdo Base party. After fiercely concentrated work of getting men and supplies from the base to the big aircraft, it took off and flew to Christchurch, New Zealand. Twelve hours later the approaching break-up of the ice would have made it impossible for an aircraft of that size to have landed. Fortunately, this did not seriously affect the American party wintering at the South Pole base, which was already well provided. According to the Commanding Officer of McMurdo Station, the only effect was that supply operations would have to start as early as possible in the next spring season.

A number of United States Navy planes were flown across from McMurdo to the Scott Base airstrip in the hope that they would be out of the danger area. But there was increasing anxiety, as the big runway parking-area on which the Globemaster had been standing twelve hours before broke clear away and floated north, driven by the strong Polar winds.

The great break-up of the ice-shelf was brought about by unusually high Ross Sea tides and the abnormal pressure of the glaciers. Risks of this kind are, in the present state of Antarctic knowledge, impossible to assess, but this was the only factor likely to snatch full success from the Trans-Antarctic party, who were rapidly making up lost time.

When Fuchs, Hillary and their party reached the Skelton Depot at Teall Island, a rocky point at the glacier foot, they had only to cover 180 miles of level going across the Ross Ice Shelf. Strong southerly winds over their last stretch had been at their backs, but these winds were also part of the reason why the approach to McMurdo Sound was uncertain.

The party started out on the home stretch on Thursday, February 27th. Meteorological information showed every probability of fair weather up to the week-end, and Fuchs and Hillary, in the leading SnoCat, cracked on the pace.

Now the critics were confounded indeed. It was a certainty that the party would complete the crossing before the seaway northward froze solid, and they would probably race to finish on the actual hundredth day, as Dr. Fuchs had planned from the start.

The only uncertainty lay in the approach to Scott Base, where the contorted ice of the Ross Shelf met the bay ice. If the tremendous cracking continued, the approach might be barred. A squad of Americans from McMurdo therefore went out with bulldozers, found a good route, and cleared a path through pressure and broken ice which the SnoCats could negotiate. On Friday, February 28th the two pilots, Lewis and Claydon, flew out to land beside the approaching party in brilliant sunshine. Amid general delight they produced rum and cigars.

Dr. Fuchs now admitted that his vehicles were "wobbly", but was full of their praises. Homard, the engineer, indeed vowed that after overhaul he would be prepared to drive them back to the Pole. However, another steering-plate had broken during the Skelton descent, and rather than lose time in the long, slow business of welding in super-freezing conditions, a rough repair had been made with wood, rope and wire. This, it was hoped, would last out the remaining distance. In any case, if the vehicle had to be abandoned, it did not matter, since the others could easily carry all that was necessary for the last, short lap.

Two days later, on Sunday, March 2nd, 1958, Dr. Fuchs, Sir Edmund Hillary and the men of the trans-continental party drove their battered and rimed yellow SnoCats into Scott Base. For the last few miles of their journey they had been escorted by tractors, sledges and any kind of vehicle in which men of the New Zealand and American bases could ride out across the ice to greet them.

To the grinning leaders in the first SnoCat it seemed that every man had a camera—and a Verey Light signal-pistol. Hissing lights of every colour in the code-book curved up into the brilliant, cold sunshine. At the Base itself a new sound arose when the trans-continental vehicles ground to a stop. It was a peculiar noise, and it came from an American band led by a trombone, but including every form of noise-producing article, from oil-drums to skiffle-boards. Fuchs has a sensitive musical ear, yet it is probable that the cadences produced by those cheerful, friendly American performers made one of the most satisfying melodies he had ever heard.

In his earlier messages while on the trail he had made it quite clear that Hillary's original route-survey and his personal guidance from Depot 700 had been of enormous help. As though to emphasise this, and to show that past differences were forgotten, he linked arms with Hillary as they stood side by side for the photographers after they had climbed down from their vehicle.

Vivian Fuchs' triumph was complete. He had fulfilled his dream of a lifetime and, in spite of all criticism and even vilification, he had accomplished his task in a day less than his original time-schedule. In the achievement of that ninety-nine-day record, Hillary's help across the last, main stage had played a vital part.

The cross that marks Captain Scott's memorial stands on a hillside close by where the two leaders and their bearded party of comrades now chatted together, and a Union Jack fluttered on a staff that Scott himself had used at that very spot forty-six years before.

While champagne corks were popping in the mess hall, the official announcement came that the Queen was to confer the honour of knighthood on Dr. Vivian Fuchs.

When he could make himself heard above the cheering, he expressed in halting words his embarrassment that he should have been personally singled out for such a distinction. The accolade, he said, with characteristic simplicity, must be taken as honouring every man who had striven with him on what Shackleton had so aptly called the last great journey on earth left to man.

APPENDIX I

A SHORT LIST OF THE EXPLORERS, FROM THE EARLIEST KNOWN TO THE PRESENT DAY, WHOSE NAMES ARE PERPETUATED ON THE CHARTS OF ANTARCTICA

Ferdinand Magellan. 1520. Spanish. Discovered the Magellan Strait, south of South America.

Sir Francis Drake. 1577. British. Rounded Cape Horn.

Lozier Bouvet. 1739. French. Discovered Bouvet Island.

de Kerguelen-Tremarec. 1773. French. Discovered Land of Desolation, now called Kerguelen-land.

Capt. James Cook. 1772–5. British. Crossed from South America to South Africa, made first crossing of Antarctic Circle, but found no land. Dismissed idea of any Sixth Continent of the South.

Capt. William Smith. 1819. British. Discovered South Shetlands.

Capt. Edward Bransfield. 1820. British. Discovered Bransfield Strait and Elephant Island.

Capt. Nat Palmer. 1820. American. First to sight Antarctic Continent, discovering Palmer Peninsula area of Grahamland.

Capt. James Weddell. 1821–4. British. Discovered the Weddell Sea.

Capt. John Biscoe. 1830–2. British. Circumnavigated Antarctic area. Discovered and named Enderby Land and Grahamland.

Capt. Peter Kemp. 1833. British. Discovered Kemp Coast.

Capt. Dumont d'Urville. 1837–40. French. Discovered Adelie Land and Claire Coast.

Capt. John Balleny. 1839. British. Discovered Balleny Islands and Sabrina Land.

Lt. Wilkes. 1839. American. Surveyed 16,000 miles of Antarctic coast. Gave name to Wilkes Land.

Sir James Clark Ross. 1839–43. British. Discovered Mounts Erebus and Terror, Cape Adare and Victoria Land. Gave name to Ross Sea.

Capt. George Nares. 1874. British. Took first steam vessel across Antarctic Circle.

Capt. Leonard Kristensen. 1894. Norwegian. Sent landing party led by Carstens Borchgrevink (Norwegian) ashore at Cape Adare, thus making first landing on Antarctic Continent.

Lt. de Gerlache. 1897. Belgian. Accompanied by Roald Amundsen (Norwegian), spent a year in Bellingshausen Sea ice-pack.

Capt. Robert Falcon Scott. 1901–4. British. Penetrated furthest yet south to 82° 16′ on route to Pole.

Prof. Erich von Drygalski. 1901–3. German. Discovered Wilhelm II Coast.

Dr. Otto Nordenskjøld. 1901–4. Swedish. Ship crushed in Weddell Sea, but all rescued.

Dr. William Bruce. 1902–4. British. Discovered Coats Land.

Dr. Jean B. Charcot. 1903–5. French. Discovered Loubet Coast.

Sir Ernest Shackleton. 1908–9. British. Reached to within ninety-seven miles of South Geographical Pole. Members of his party discovered South Magnetic Pole, the Beardmore Glacier, and climbed Mount Erebus.

Dr. Jean B. Charcot. 1908–10. French. Discovered Marguerite Bay and charted Fallieres Coast.

Capt. Roald Amundsen. 1910–12. Norwegian. First man to reach the South Geographical Pole.

Capt. Robert Falcon Scott. 1910–13. British. Reached South Geographical Pole some five weeks after Amundsen. He and his party lost their lives on the return march.

Lt. Choku Shirase. 1911–12. Japanese. Discovered Kainan Bay and Okuma Bay.

Dr. Wilhelm Filchner. 1911–12. German. Discovered Luitpold Coast and Filchner Ice Shelf.

Sir Douglas Mawson. 1911–14. British. Extensive surveys from Commonwealth Bay, Adelie Coast.

Sir Ernest Shackleton. 1914–16. British. Attempted first Antarctic trans-continental crossing. Ship crushed and lost in ice of Weddell Sea. Sailed ship's lifeboat, with party of five, eight hundred miles to South Georgia.

SIR ERNEST SHACKLETON. 1921–2. British. When starting new expedition, died suddenly in South Georgia.

SIR HUBERT WILKINS. 1928–9. British. Made first Antarctic aircraft flights. Extensive exploration.

REAR ADMIRAL RICHARD BYRD. 1928–30. American. Made first flight over South Geographical Pole, and carried out extensive exploration.

SIR DOUGLAS MAWSON. 1929–31. British. Discovered Mac-Robertson Coast. Extensive exploration.

LINCOLN ELLSWORTH. 1933–4. American. Made unsuccessful attempt at trans-Antarctic flight.

REAR ADMIRAL RICHARD BYRD. 1933–5. American. First man to winter alone in Antarctica. Extensive aerial exploration.

LINCOLN ELLSWORTH. 1934–5. American. Made second unsuccessful attempt at flight across Antarctica.

LINCOLN ELLSWORTH. 1935–6. American. On third attempt at trans-Antarctic flight, started from Dundee Island, and in stages reached sixteen miles short of Bay of Whales. Continued remainder of journey on foot. Extensive further air exploration in 1938–9.

REAR ADMIRAL RICHARD BYRD. 1939–40. American. Further extensive exploration and discovery.

OPERATION HIGHJUMP. 1946–7. American. Extensive aerial mapping by groups operating from ships. Admiral Byrd again flew across the South Geographical Pole.

CLAIM BY CHILE. 1948. Chileans claimed and occupied Greenwich Island. Further Chilean bases established 1949.

FALKLAND ISLANDS DEPENDENCIES. 1949–on. Extensive surveys by British parties.

SOVIET EXPEDITIONS. 1949–on. From 1949 onwards, a number of large Russian expeditions have explored and set up bases in Antarctica, but have not released information.

FRENCH PERMANENT WEATHER STATION. 1949. Set up in Adelie Land.

CLAIMS BY ARGENTINE. 1950–on. Claim made on Hope Bay. Permanent weather station set up at Luna Bay, South Shetlands.

AUSTRALIAN WEATHER STATION. 1953–5. Set up in Australian Antarctic.

PRELIMINARY SURVEY FOR THE INTERNATIONAL GEOPHYSICAL YEAR. 1954. By U.S. Navy.

INTERNATIONAL GEOPHYSICAL YEAR ANTARCTIC EXPEDITIONS. 1957–8. British Commonwealth, American, French, Russian and many other national bases set up in Antarctica. Death of Admiral Richard Byrd during preparation for American expedition.

BRITISH COMMONWEALTH TRANS-ANTARCTIC EXPEDITION. 1956–8. Under leadership of Dr. Vivian Fuchs. New Zealand support party led by Sir Edmund Hillary.

APPENDIX II

CAPTAIN SCOTT'S EXPEDITION 1900–4

Officers

Capt. Robert Falcon Scott, R.N.
Lt. Albert B. Armitage, R.N.R.
Lt. Charles W. R. Royds, R.N.
Lt. Michael Barne, R.N.
Sub-Lt. Ernest H. Shackleton, R.N.R.
Sub-Lt. George F. A. Mulock, R.N.
Lt. (E.) Reginald W. Skelton, R.N.

Scientific Staff

Reginald Koettlitz. Surgeon and Botanist.
Edward A. Wilson. Surgeon, Artist, Vertebrate Zoologist.
Thomas V. Hodgson. Biologist.
Hartley T. Ferrar. Geologist.
Louis C. Bernacchi. Physicist.

Men

Petty Officer David Allan, R.N.
Pte. A. H. Blissett, R.M.L.I.
Ship's Cook Charles Clarke.
Able Smn. Thomas Crean, R.N.
Petty Officer Jacob Cross, R.N.
Able Smn. George B. Croucher, R.N.
Carpenter Fred E. Dailey.
Able Smn. James Dell, R.N.
Second Engineer James H. Dellbridge.
Petty Officer Edgar Evans, R.N.
Boatswain Thomas A. Feather.
Ship's Steward Charles R. Ford.
Able Smn. Jesse Handsley, R.N.
Able Smn. William L. Heald, R.N.

Able Smn. Ernest E. Joyce, R.N.
Petty Officer Thomas Kennar, R.N.
Ldg. Stoker William Lashly, R.N.
Ldg. Smn. Arthur Pilbeam, R.N.
Stoker Frank Plumley, R.N.
Ldg. Stoker Arthur L. Quartley, R.N.
Pte. Gilbert Scott, R.M.L.I.
Petty Officer William Smythe, R.N.
Able Smn. William J. Weller, R.N.
Ldg. Stoker Thomas Whitfield, R.N.
Able Smn. Frank Wild, R.N.
Able Smn. Thomas S. Williamson, R.N.

CAPTAIN SCOTT'S EXPEDITION 1910–13

Officers

Capt. Robert Falcon Scott, C.V.O., R.N.
Lt. Edward R. G. R. Evans, R.N.
Lt. Victor L. A. Campbell, R.N. (Emergency List).
Lt. Henry R. Bowers, R.I.M.
Capt. Lawrence E. G. Oates, Sixth Inniskilling Dragoons.
G. Murray Levick, Surgeon, R.N.
Edward L. Atkinson, Surgeon, R.N. Parasitologist.

Scientific Staff

Edward Adrian Wilson, B.A., M.B. (Cantab). Chief of Scientific Staff and Zoologist.
George C. Simpson, D.Sc. Meteorologist.
T. Griffith Taylor, B.A., B.Sc., B.E. Geologist.
Edward W. Nelson. Biologist.
Frank Debenham, B.A., B.Sc. Geologist.
Charles S. Wright, B.A. Physicist.
Raymond E. Priestley. Geologist.
Herbert G. Pontino, F.R.G.S. Camera Artist.
Cecil H. Meares. In charge of dogs.
Bernard C. Day. Motor Engineer.
Apsley Cherry-Garrard, B.A. Asst. Zoologist.
Tryggve Gran, Sub-Lt. Norwegian N.R., B.A. Ski Expert.

Men

Chief Stoker W. Lashly, R.N.
Chief Steward W. W. Archer, late R.N.

Cook Thomas Clissold, late R.N.
Petty Officer Edgar Evans, R.N.
Petty Officer Robert Forde, R.N.
Petty Officer Thomas Crean, R.N.
Petty Officer Thomas S. Williamson, R.N.
Petty Officer Patrick Keohane, R.N.
Petty Officer George P. Abbott, R.N.
Petty Officer 2nd Class Frank V. Browning, R.N.
Able Smn. Harry Dickason, R.N.
Steward F. J. Hooper, late R.N.
Anton Omelchenko. Groom.
Demetri Gerof. Dog Driver.

FIRST MEN TO REACH THE SOUTH GEOGRAPHICAL POLE, 14 DECEMBER, 1912

Roald Amundsen
Olav Bjaaland.
Helmer Hanssen.
Oscar Wisting.
Sverre Hassel.

SHACKLETON EXPEDITION 1907–9

Furthest South Party

Sir Ernest Shackleton.
Lt. J. B. Adams, R.N.R. Meteorologist.
Dr. E. Marshall. Surgeon.
Frank Wild.

Mount Erebus Party

Prof. Sir T. W. Edgeworth David. Leader.
Sir Douglas Mawson. Physicist.
Dr. A. E. Mackay. Surgeon.

Supporting Party

Lt. J. B. Adams, R.N.R.
Dr. E. Marshall.
Sir Philip Brocklehurst, Bart. Junior Geologist.

South Magnetic Pole Party

Prof. Sir T. W. Edgeworth David. Leader.
Sir Douglas Mawson. Physicist.
Dr. A. E. Mackay. Surgeon.

SHACKLETON'S EXPEDITION, 1914–17

Sir Ernest Shackleton. Leader.
Frank Wild. Second-in-Command.
Thomas Crean. Second Officer of *Endurance.*
A. Cheetham. Third Officer of *Endurance.*
G. Marston. Artist.
F. Hurley. Photographer.
Captain Frank H. Worsley. Skipper of *Endurance.*
H. Hudson. Navigating Officer.
L. Greenstreet. First Officer.
L. Rockinson. Chief Engineer.
A. Kerr. Second Engineer.
Dr. J. A. McIlroy. Surgeon.
Dr. A. H. Macklin. Surgeon.
R. S. Clark. Biologist.
L. D. A. Hussey. Meteorologist.
J. M. Wordie. Geologist.
R. W. James. Physicist.
T. Orde-Lees. Motor Expert.
W. McNish. Carpenter.
T. McCarthy. A.B.
J. Vincent. A.B.
T. Green. Cook.
A. Blackborrow. Steward.
A. Howe. A.B.
A. Bakewell. A.B.
T. McLoed. Fireman.
H. Stephenson. Fireman.
A. Holness. Fireman.

Ross Sea Party

Ernest Wild.
W. R. Richards.
V. Hayward.
Capt. A. Mackintosh.
Ernest Joyce.
Spencer Smith.
A. Stevens.
Jack.
Gaze.
Cope.
Ninnis.
Hooke.
Stenhouse.

Members of the Crew of the Ford Aircraft "Floyd Bennett", on the First Flight to the South Geographical Pole. 28 November, 1929.

Rear Admiral Richard E. Byrd.
Bernt Balchen.
Harold June.
Captain Ashley McKinley.

ADMIRAL BYRD'S SECOND EXPEDITION, 1934

Shore Party

C. A. Abele, Jnr.
Clay Bailey.
R. B. Black.
Quin A. Blackburn.
E. H. Bramhall.
V. Boyd.
W. H. Bowlin.
Richard E. Byrd.
A. Carbone.
Leroy Clark.
Stevenson Corey.
E. F. Cox.
F. S. Dane.
E. J. Demas.
Frederick G. Dustin.
J. N. Dyer.
Albert Eilefsen.
Bernard Fleming.
George Grimminger.
W. C. Haines.
John Herrmann.
Jo Hill, Jnr.
Guy Hutcheson.
Alan Innes-Taylor.
H. I. June.
W. P. Lewisohn.
Alton A. Lindsey.
W. S. McCormick.
L. T. Miller.
E. L. Moody.
C. G. Morgan.
C. J. V. Murphy.
G. O. Noville.
David Paige.
J. A. Pelter.
E. B. Perkins.
Carl O. Petersen.
Stuart D. L. Paine.
L. H. Potaka.
Thomas C. Poulter.
Finn Ronne.
Kennett L. Rawson.
Richard S. Russell.
Paul A. Siple.
Bernard W. Skinner.
Olin D. Stancliff.
J. M. Sterrett.
Isaac Schlossbach.
Ralph W. Smith.
Paul Swan.
Ivor Tinglof.
J. H. Von der Wall.
F. Alton Wade.
Amory H. Waite, Jnr.
H. R. Young.
Arthur A. Zuhn.

1957–1958 COMMONWEALTH TRANS-ANTARCTIC EXPEDITION

Overall Leader: Dr. Vivian Fuchs.

Advance Party

Ken Blaiklock. Leader. Surveyor.
Ralph A. Lenton. 2nd in Command. Carpenter and Radio Operator.
R. H. A. Stewart. Meteorologist.
Johannes La Grange. Meteorologist.
P. J. Jeffries. Meteorologist.
Roy Homard. Engineer.
Sgt. E. (Taffy) Williams. Radio Operator.
Dr. Rainer Goldsmith. Medical Officer.

Continental Crossing Party

Dr. Vivian Fuchs. Leader. Geologist.
David Stratton. 2nd in Command. Surveyor.
Ken Blaiklock. Surveyor.
Ralph A. Lenton. Radio Operator.
Johannes La Grange. Meteorologist.
David Pratt. Engineer.
Roy Homard. Engineer.
Geoffrey Pratt. Seismologist.
Dr. Alan Rogers. Physiologist.
Dr. Hal Lister. Glaciologist.
Dr. Jon Stephenson. Geologist.
George Lowe. Photographer.

Royal Air Force Contingent

Squadron Leader John Lewis.
Fl. Lt. Gordon Haslop.
Fl. Sgt. Peter Weston.
Sgt. Taffy Williams.

New Zealand Party

Sir Edmund Hillary. Leader.
J. H. Miller. 2nd in Command. Surveyor.
H. H. Ayres. Dog handler.
B. M. Gunn. Geologist.

P. D. Mulgrew. Radio Operator.
Murray Ellis. Engineer.
J. G. Bates. Engineer.
J. E. Gawn. Radio Operator.
Dr. G. Marsh. Medical Officer.
Lt. Richard Brooke. Surveyor.
E. S. Bucknall. Cook.
G. Warren. Assistant Geologist.
R. A. Carlyon. Surveyor.
E. Wright. Photographer.
D. R. Balham. Marine Biologist.

Royal New Zealand Air Force Contingent

Squadron Leader John Claydon.
Flying Officer W. J. Cranfield.
Sgt. L. W. Tarr.

New Zealand Party which Established Route to Depot 700 and to the South Pole

Sir Edmund Hillary. Leader.
Murray Ellis. Engineer.
J. G. Bates. Engineer.
P. D. Mulgrew. Radio Operator.
E. Wright. Photographer.

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